Effigies Authoris.

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Arithmetick
Made Eaſie

For the Uſe and Benefit of

TRADES-MEN.

Wherein the

NATURE and USE of *FRACTIONS*,
both VULGAR and DECIMAL, are
TAUGHT by a New and Exact
METHOD.

ALSO

The Menſuration of SOLIDS and
SUPERFICIES.

The Fourteenth Edition, Corrected and Amended.

By *J. AYRES*, late *Writing-Maſter*,
in St. *Paul's* Church-Yard, *London*.

To which is Added, A Short and Eaſy
METHOD; after which Shop-keepers
may *State*, *Poſt*, and *Balance* their *Books*
of *ACCOMPTS*.

By *CHARLES SNELL*, Writing-Maſter,
and Accomptant, in *Foſter-Lane*, *London*.

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To the Right Honourable

ir *William Aſhhurſt*, Kt.

LORD MAYOR

OF THE

ity of *LONDON*,

This Manual of

Practical Arithmetick,

IS

UMBLY DEDICATED
AND PRESENTED

BY

Your Lordſhip's
Moſt obliged
Humble Servant,

JOHN AYRES.

The PREFACE.

THIS *Manual of* Practical Arithmetick, *adapt chiefly for the* Benefit *and* Uſe *of* Tradeſmen, *the Product of ſome vacant Hours. A* Work *for its Natu and Kind* differing *from any thing heretofore Publiſh that I know of: All the* Rules *being made* plain *a* eaſie *to the* meaneſt *Capacities, for whoſe ſakes it principally intended; Which is the Reaſon ſo much of th* Book *is taken up in* Explaining *and* Teaching *th* Ground-work, *viz. Addition, Subtraction, Multiplication, and Diviſion, which moſt Arithmetick Books are def cient in; a Defect in any of thoſe Rules will render th Labours of ſuch as learn Arithmetick by Books very diff cult and hard. To help which I have firſt of all laid dow the* plaineſt way of Diviſion *for a Learner that want the help of a Maſter, and afterwards have given th* ſhorteſt Italian way of Diviſion. *I have alſo omitte ſeveral Rules that are not of Uſe in Trade, ſuch as* Alligation, Barter, Loſs and Gain, Company with Time *&c. And have ſupplied thoſe Omiſſions with what i more Uſeful and Practical,* viz. *Great Enlargements, a Variety of the Golden Rule of Three, the Rule of Thr Inverſe, Double Rule of Three, and the Uſe of the Compound Rule of* Five Numbers *in working Intereſt, a the Nature of Exchange, Rules of Practice, with grea Variety, and* ſhort ways *to caſt up* Merchandize. *Th Order of* Deducting Tare *and* Ret, *with other Rul Uſeful in* Trade. *Laſtly, I have made* Fractions *ve* eaſie *and* familiar *(tho' differing from any former* Method) *having mixed both* Vulgar *and* Decimal Fractions *together under the ſame Head, that the Ingenio may diſcover the* Eaſe *as well as* Excellency *and* Brevity *of the* Decimal *beyond the* Vulgar Fraction. *An as my* Paper *wou'd admit, have added ſome* Variety *o* Meaſuring Superficies *and* Solids.

The Faults in the former Impreſſions, care ha been taken to correct in this *Fourteenth Edition.*

Arithmetick.

Arithmetick.

CHAP. I.

f NUMERATION.

. ARITHMETICK is the Art of Numbering well, or of Accompting well by Numbers; For as Magnitude or Greatneſs is he Subject of *Geometry*, ſo is Multitude or Num-er the Subject of *Arithmetick*.

II. The whole Art of *Arithmetick* depends upon he true Knowledge of the Five following Rules, iz. *Numeration*, *Addition*, *Subtraction*, *Multiplication* nd *Diviſion*. All the other Rules being compound-d of theſe, we ſhall treat particularly of them in heir order.

III. NUMERATION *Teaches to expreſs or write own the value of any Number whatſoever propoſed.*

IV. All Numbers are written with Ten Charaters called Figures, of which the laſt is called a Cypher, and of it ſelf ſignifieth nothing, but ſerveth (according as it is placed) to increaſe or diminiſh the Value of another Figure to which it is either annexed or prefixed.

V. The Ten *Characters* or *Figures* by which all Numbers are expreſſed, are thus *written*, *viz.* 1. one; 2, two; 3, three; 4, four; 5, five; 6, ſix; 7. ſeven; 8, eight; 9, nine; 0, Cypher: The Nine firſt of theſe are called ſignificant Figures.

VI. All Numbers are either *Simple* or *Compound*.

1. A Number is ſaid to be *Simple*, when it conſiſteth but of *one Figure*, as 4, 8, and 6, *&c.* are ſimple or ſingle Numbers.

2. A Number is ſaid to be a *Compound* Number, when it is compoſed of *two, three, four,* or *more Figures*; ſuch as are 35, 356, and 7428, *&c.*

VII. Every *ſignificant Figure* hath a double Value, *viz. Certain* or *Uncertain*.

1. The *value* of a Figure may be ſaid to be *certain*, when it ſignifieth *ſimply* its *own* proper *Value*, without the Addition of any other Word for its Explanation, and ſo 4 ſignifieth *four*, 8 ſignifieth *eight*, and 9 is *nine*, &c.

2. The *value* of a Figure may be ſaid to be *uncertain*, in reſpect of the *place* it may ſtand in, and ſo 4 may ſignifie *forty*, or *four hundred*, or *four thouſand*, &c. and 8 may ſignifie *eighty*, or *eight hundred*, or *eight thouſand*, &c.

VIII. When a *Number* is compoſed of divers *Figures* ſet together like the Letters in a Word, that *Number* is ſaid to *conſiſt* of as many places as there are *Figures* uſed in the compoſing thereof. So the Number 4643 is ſaid to *conſiſt* of *four* places, becauſe it is compoſed of *four* Figures; the like is to be underſtood of any other.

IX. The *places* in *every Compound* Number are to be conſidered both as to their *order*, and their *value*.

1. The *order* of the *places* is from the *right hand* to the *left*, the *firſt Figure* or *Cypher* towards the *right hand* is ſaid to poſſeſs the firſt place, and the next towards the *left hand* is ſaid to poſſeſs the ſecond place, and the next to that the third place, *&c.*

So if this *Number* were propoſed, *viz.* 5734, here 4 is ſaid to poſſeſs the firſt, 3 the ſecond, 7 the third, and 5 the fourth place, *&c.*

2. The *value* of every *Figure*, is diſcovered by the place that it ſtands in; *viz.* The *firſt* place is

he place of *Units*, or ones; and the Figure that ſtandeth in that place ſignifieth its *own* proper or ſimple *Value*. The *ſecond* place is the place of *Tens*, nd the Figure that ſtandeth there ſignifieth as many *Tens* as the Figure it ſelf containeth *Units*: As if it be 4, it ſignifieth four *tens*, or forty; if it be 7, it ſignifieth ſeven *tens*, or ſeventy, *&c.* The *third* place is the place of *Hundreds*, and the Figure that ſtandeth there, is as many *Hundreds* as it containeth *Units*: So 5 in the third place is five *hundred*, and 6 ſignifieth ſix hundred, *&c.* The *fourth* place is the place of *Thouſands*, and the Figure that ſtandeth therein ſignifieth as many *thouſands* as it contains *Units*, ſo 8 in the *fourth* place is eight *thouſand*, and 4 is four *thouſand*, *&c.* As,

Suppoſe this Number, *viz.* 4652. were given to have its *Value* expreſſed; the Figure 2, (in the *firſt* place) is two *Units*, or ſimply *two*; the Figure 5 (in the *ſecond* place) is five *tens* or fifty; ſo 52 is thus expreſſed, *viz. fifty two*: The Figure 6 (in the *third* place) is ſix hundred, ſo 652 is thus expreſſed, *viz. Six hundred fifty two*; the Figure 4 (in the *fourth* place) is *Four thouſand*, ſo 4652 is thus to be read, *viz. Four thouſand ſix hundred fifty two*.

In like manner if any Figure hath a *Cypher*, or *Cyphers* annexed to it, it ſhall ſtill retain the *value* of its place, as much as if a ſignificant Figure, or Figures, were annexed to it in the room of the *Cypher* or *Cyphers*; ſo if to the Figure 6 there be a *Cypher* annexed thus (60) its value is *ſix tens* or *ſixty*, becauſe it ſtandeth in the ſecond place, or place of *Tens* Likewiſe if it have two *Cyphers* annexed to it thus (600) its value is *Six hundred*, becauſe it poſſeſſeth the third place, or place of *Hundreds*. Alſo (6000) is *Six thouſand*, becauſe 6 ſtandeth in the fourth place, or place of *Thouſands*.

And the Value of any Figure increaſeth in *Decuple* Proportion from the *right* Hand to the *left*, every place being *ten times* the Value of the former, as you may ſee in the following Table.

Numeration TABLE.

Hundreds of Millions	*Tens of Millions*	*Millions*	*Hundreds of Thouſands*	*Tens of Thouſands*	*Thouſands*	*Hundreds*	*Tens*	*Units*	*The Numbers in the* TABLE *are thus to be Read*, viz.
9	8	7	6	5	4	3	2	1	987 Mil. 654 Th, 321
1	2	3	4	5	6	7	8	9	123 Mil. 456 Th. 789
	2	3	4	5	6	7	8	9	-23 Mil. 456 Th. 789
		3	4	5	6	7	8	9	—3 Mil. 456 Th. 789
			4	5	6	7	8	9	——— 456 Th. 789
				5	6	7	8	9	——— 56 Th. 789
					6	7	8	9	——— 6 Th. 789
						7	8	9	——— 789
							8	9	——— 89
								9	——— 9

Over againſt every place of the Numbers in th foregoing Table is written (in words at length) th Value thereof; *viz. Units, Tens, Hundreds, Thouſands &c.* which words being perfectly gotten by heart and well underſtood, the Learner will be thereby enabled to expreſs or write down the Value of any Number propoſed.

And on the right hand of the Table, over-againſt every Number therein contained, you have Direction how to read or expreſs thoſe Numbers: As

987654321 is thus to be read, *viz. Nine hundred ighty ſeven Millions, Six hundred fifty four Thouſand, Three hundred twenty one.* And the like is to be underſtood of the reſt.

Note, Although the foregoing Table be made to conſiſt but of Nine Places, yet it may be continued to more Places at pleaſure, even *ad infinitum,* obſerving that the Value of every place is Ten times as much as that which goeth before it ; ſo the tenth place is *Thouſands of Millions,* the eleventh place is *Tens of Thouſands of Millions,* the twelfth place is *Hundreds of Thouſands of Millions,* and the thirteenth place is *Millions of Millions,* &c.

There is yet another Method uſed by ſome, that is very plain and uſeful in the expreſſing of great Numbers, or Numbers conſiſting of many places, which is this, *viz.* make a point after every third Figure, beginning at the right hand, as in the following *Example.*

Let this Number be propoſed conſiſting of Fourteen places, *viz.* 84639042724536, and when every Third Figure is pointed, it will be thus, *viz.* 84. 639. 042. 724. 536. every Three Figures being called a Period, and are reckoned in order from the right hand towards the left, *viz.* 536 is the firſt Period, 724 is the ſecond Period, 042 the third, *&c.* the firſt Period (which is 536) conſiſteth of *Units, Tens,* and *Hundreds,* and is thus expreſſed, *viz. Five Hundred Thirty Six,* and every other Period is to be read in every reſpect as if it ſtood in the place of the firſt Period, only in expreſſing the value of the ſecond Period, you muſt add thereto the word *Thouſand* ; to the third Period you muſt add the word *Millions*; to the fourth Period the word *Thouſands* ; to the fifth Period *Millions of Millions* ; and ſo the Number before propoſed is to be read as followeth, *viz.*

Millions

$$\overbrace{84}^{\textit{Millions of Millions}}.\overbrace{639}^{\textit{Thouſands}}.\overbrace{042}^{\textit{Millions}}.\overbrace{724}^{\textit{Thouſands.}}.\overbrace{536}.$$

Eighty four *Millions of Millions*, Six hundred thirty nine *Thouſand*, forty two *Millions*. Seven hundred twenty four *Thouſand*, Five *Hundred* thirty ſix.

CHAP. II.

Of ADDITION.

ADDITION *Teacheth to add, or put together divers Numbers, and to bring them to one total Sum.* As if Seven and Nine were given to be added together, their Sum will be 16; and the Sum of 5 and 4 is 9.

II. *Numbers* to be added together, each of them *conſiſts* either of *one* Denomination, or of *divers*, as if it were required to add 16 *l.* to 14 *l.* here both the given *numbers* are of one Denomination, being *Pounds* only, without Shillings, Pence or Farthings: But if it were required to add 36 *l.* 14 *s.* 08 *d.* to 16 *l.* 12 *s.* 06 *d* theſe conſiſt of *divers* Denominations, *viz* of Pounds, Shillings and Pence.

III. When it is required to *add* together ſeveral *Numbers* of one *Denomination*, they muſt (in order to the Work) be diſpoſed of according to the following *Rule*, viz.

Place *the given Numbers one under the other in ſuch Order, that Units may ſtand under Units, Tens under Tens, Hundreds under Hundreds, Thouſands under Thouſands*, &c.

If you were to add 136 and 42 together, they muſt be placed one under the other as followeth, *viz.*

$$\begin{array}{r}136\\42\end{array}\qquad\text{Or,}\qquad\begin{array}{r}42\\136\end{array}$$

IV. Having placed the given Numbers as before is directed, then draw a ſtreight Line under them, and (beginning at the Place of *Units*) add all the Figures together that ſtand over one another in that *Rank*; putting their Sum under the ſaid ſtreight Line; as in this Example, I ſay, 2 and 6 is 8, wherefore I put 8 under the Line, and in its proper place, *viz.* under 2 and 6. and proceed to the next Rank which is the place of Tens, ſaying, 4 and 3 is 7, wherefore I put 7 in its proper place under the Line; and proceed to the next and laſt Rank, where I find only 1, wherefore I put one in its proper place under the Line, and ſo the Work is finiſhed, and I find thereby that the Total Sum of 136 and 42 to be 178: See the Operation as followeth.

$$\begin{array}{r}136\\42\\\hline 178\end{array}\qquad\qquad\begin{array}{r}42\\136\\\hline 178\end{array}$$

V. If in adding together any of the Ranks (as is before directed) the Sum amounts to, or exceedeth 10, or any Number of Tens, then in ſuch Caſe you are either to ſet down a *Cypher* under the Line in its proper place, or elſe the *exceſs* above the *ten* or *tens*; and for every *ten* carry an *unit* to be added to the next *Rank* of Figures. As if it amount to 30, then ſet down (0) a *Cypher*, and carry 3 (for the *thre tens*) to be added to the next *Rank*; if it amount to 34, then ſet down 4 under the *Rank* that you *added*, and carry *three* to the next, *&c.* And when you have caſt up the laſt *Rank* or *Series* towards the left hand, ſet down the Total that it amounteth to, as in the following Examples.

	(1)	(2)	(3)	(4)
	748	4758	1648	20864
	364	6473	3472	78987
	296	2894	1865	6217
	242	1862	3479	4320
Sum	1650	15987	10464	110388

In the firſt of theſe Examples I begin, ſaying, 2 and 6 is 8, and 4 is 12, and 8 makes 20, which is juſt two tens; wherefore I put down 0 under the line, and carry 2 to the next Rank for the 2 tens, and proceed, ſaying, 2 that I carry and 4 is 6, and 9 is 15, and 6 is 21, and 4 is 25, which is 5 above 20, wherefore I put down 5 under the line, and carry 2 for the 2 tens to the next Rank, and then proceed, ſaying, 2 that I carry and 2 is 4, and 2 is 6, and 3 is 9, and 7 makes 16, wherefore (becauſe it is the laſt Rank) I put down 16 under the Line, and ſo the work is finiſhed, the total Sum of the Addition being 1650: The ſame is to be obſerved in the reſt of the Examples.

VI. *Addition of diverſe Denominations* cannot be well performed, untill you know the value of common Coins, Weights and Meaſures, *&c.* As how many Pence make 1 Shilling, how many Shillings make 1 Pound, and how many Ounces make 1 Pound, how many Pounds make a Quarter of a C. ad how many Quarters make a C. weig[illegible]t.

In Addition of Engliſh Money, It is neceſſary firſt of all to underſtand the Meaning and Signification of the Characters ſuperſcribed over every Sum, as *lib. s. d.*

Note, That *lib.* ſignifies **Libra**, a *Pound*, not here in reſpect to common Weight, but *Money*, and for diſtinction is called a *Pound Sterling.* So *s.* ſtands for **Solidus** (a Coin of Braſs) uſed by the *Romans*, but with us of Silver, and ſignifies a *Shilling*; twenty of theſe Pieces make *One Pound Sterling.*

de. or *d.* ſtands for **Denarius**, a *Penny*, which contained Ten Pieces of the *Romans* leaſt Coin: It hath had a various Eſtimate in our *Engliſh Coins.* It now ſignifies a Penny, the 12th part of a Shilling, or 12 of which make a Shilling. For until the Reign of *Henry* VI. a Penny was the 20th part of an Ounce of Silver, and in his Reign made the 30th. By *Edward* IV. 40 Pence made an Ounce. By *Henry* VIII. there was allowed 45 *d.* to the Ounce. And by Q. *Elizabeth* an Ounce of Silver was divided into 60 parts, called Pence, as it is at this day.

ADDITION of MONEY.

Note, 4 *Farthings is a Penny*, 12 *Pence a Shilling*, *and* 20 *Shillings a Pound* Sterling, *or* Engliſh *Money.*

The following TABLE ought to be learn'd by heart.

			d.	*s.*	*d.*
12 times	1 is	12	20 is	1	8
	2	24	30	2	6
	3	36	40	3	4
	4	48	50	4	2
	5	60	60	5	0
	6	72	70	5	10
	7	84	80	6	8
	8	96	90	7	6
	9	108	100	8	4
	10	120	110	9	2
	11	132	120	10	0
	12	144			

VII. When it is required to add together *Numbers* conſiſting of *divers Denominations*, you are to place the given Numbers in ſuch order one under the other, that each Rank may conſiſt of one and the ſame Denomination. That is to ſay, if it be in Money: Let *Pounds* be ſet under *Pounds*, *Shillings* under *Shillings*, *Pence* under *Pence*, and *Farthings* under *Farthings*. The like is to be underſtood of *Weight*, *Meaſure*, *Time*, &c.

Then (having firſt drawn a Line under them) add them together, conſidering how many of each ſmaller Denomination make an Unit of the next that is ſuperior to it, (always obſerving to begin at the leaſt Denomination) and for every ſuch Unite, carry 1 to the next ſuperior Denomination, *viz.* If it be in Addition of Money, for every 4 in the Farthings you muſt carry 1 to the Pence (becauſe 4 Farthings is a Penny;) (for every 12 in the Pence carry 1 to the Shillings (becauſe 12 Pence is a Shilling; and for every 20 contained in the Shillings, carry 1 to the Pounds (becauſe 20 Shillings is a Pound;) And the odd Farthings, Pence and Shillings, ſet down in their proper Ranks under the Line, as in the following Example.

Some do indeed make a place of *Farthings*, and ſet a *q.* over them for *quartillier*, which is not very proper, and ſeldom uſed by Men of Buſineſs; therefore when you would write down Three *Farthings*, or a *Half-penny*, or a *Farthing*, write it thus:

: $\frac{3}{4}$ ———— *Three Farthings.*
: $\frac{1}{2}$ ———— *A Half-penny.*
: $\frac{1}{4}$ ———— *A Farthing.*
:

Let it be required to add together 134 *l.* 16 *s.* 08 *d.* $\frac{1}{4}$. and 286 *l.* 10 *s.* 4 *d.* $\frac{3}{4}$. and 498 *l.* 13 *s.* 06 *d.* $\frac{1}{2}$. and 794 *l.* 18 *s.* 09 *d.* $\frac{1}{4}$. Then in order to he Work I ſet them down and draw a Line under hem, as followeth.

l.		*s.*		*d.*
134	:	16	:	08 ¼
286	:	10	:	04 ¾
498	:	13	:	06 ½
794	:	18	:	09 ¼

Firſt, I begin with the leaſt Denomination, which s that of Farthings and add them together, ſaying, ¼ and ½ is ¾, and ¾ is 6, and ¼ is 7 Farthings, hich is 1 Penny and 3 Farthings, wherefore I put 3 Farthings under the Line, and under the Denomination of Farthings, and carry 1 (for the Penny) o the next Denomination of Pence, ſaying, 1 that I carry and 9 is 10, and 6 is 16, and 4 is 20, and 8 is 28, now 28 Pence is 2 Shillings 4 Pence, wherefore I put 4 under the Line, and carry 2 Shillings to the Denomination of Shillings, ſaying, 2 that I carry and 18 is 20, and 13 is 33, and 10 is 43, and 16 is 59 Shillings, which is 2 Pounds 19 Shillings, whereof I put the 19 Shillings under the Line, and under the Denomination of Shillings, and carry 2 (for the 2 Pounds) to the Denomination of Pounds, and proceed, ſaying, 2 that I carry and 4 is 6, and 8 is 14, and 6 is 20, and 4 makes 24, wherefore I put down 4 under the Line, and carry 2 for the two Tens to the next Rank, ſaying, 2 that I carry and 9 is 11, and 9 is 20, and 8 is 28, and 3 is 31, which is 1 above 30, wherefore I put 1 under the Line and carry 3 (for the three tens) to the next Rank, and proceed, ſaying, 3 that I carry and 7 is 10, and 4 is 14, and 2 is 16, and 1 is 17, wherefore I put 17 under the Line, becauſe it is the Sum of the laſt Rank, and ſo the whole Work is finiſhed, and I find the Sum of the given Numbers to be 1714 *l.* 19 *s.* 4 *d.* 03 *q.* as by the following Work appeareth.

	l.	*s.*	*d.*
	134	16	08 $\frac{1}{4}$
	286	10	04 $\frac{3}{4}$
	498	13	06 $\frac{1}{2}$
	794	18	09 $\frac{1}{4}$
Sum	1714	19	04 $\frac{3}{4}$

To prove your Addition; after you have added up your whole Sum, draw a Line with your Pen under the uppermoſt Number, or Sum, and then add together all the other Numbers, except the *uppermoſt*. And when you have ſo done, add the Amount, or Sum thereof to the uppermoſt Sum above the Line; and if that Sum be equal to the Sum firſt found, the Work is true, otherwiſe not.

Here, *Note once for all*, That whatſoever Sums you are to add together, whether of *Money*, *Weight*, *Meaſure*, *Time*, &c. that when you come to the greateſt Denomination, as you caſt up the ſeveral Ranks thereof, you are to carry the Tens of every preceding Rank to that which follows it, as is directed in the *Fifth Section* of this Chapter, and as the Ranks in the Denomination of Pounds in the laſt *Example* are caſt up.

The old common way of Addition of Money, is to make a *ſpeck* or tittle with your *Pen* at every 12 that is found in the *Addition* of your *Pence*, and ſo many *ſpecks* as you find, carry ſo many *Shillings* to the place of Shillings, ſetting down what remains above 12 under the place of *Pence*. Then make a *ſpeck* at every 20 you find in the *Addition* of your *Shillings*, and for ſo many *ſpecks* carry ſo many *Pounds* to the place of Pounds, ſetting down the *overplus* under the place of Shillings, and then proceed to add up the Pounds.

But the beſt Method, which I would commend to your Practice is this:

Firſt, Caſt up your Pence, or make a ſmall Comma at every 60 *d.* which is 5 *s.* (and it will be a great eaſe to the Memory where Sums are long) and by the foregoing Table you may readily know, how many Shillings and Pence your Pence amount to; then ſet down your odd Pence under the place of Pence, and carry your Shillings to the Unit of Shillings, and add them up as in Addition of Numbers, by ſetting down the odd above the Tens, and carry the Tens to the Tens of Shillings, or Angels (becauſe 10 *s.* is an Angel) then for every two in place of Angels carry ſo many Pounds to the place of Pounds. An Example or two will make it plain and eaſie.

Example I.

A Shop-keeper looking over his Shop-Book, finds that A *owes him* 195 *l.* 11 *s.* 9 *d.* $\frac{1}{2}$. B 57 *l.* 14 *s.* 10 *d.* $\frac{1}{4}$. C 450 *l.* 10 *s.* 2 *d.* D 27 *l.* 16 *s.* 11 *d.* $\frac{3}{4}$. E 44 *l.* 13 *s.* 9 *d.* $\frac{1}{2}$. F 100 *l.* G 8 *l.* 14 *s.* 9 *d.* $\frac{1}{2}$. H 160 *l.* 10 *s.* 2 *d.* $\frac{1}{2}$. I 54 *l.* 11 *s.* 11 *d.* K 73 *l.* 9 *s.* 10 *d.* $\frac{1}{4}$.

In order to the Work, place the Sums one under the other, as is before directed, thus.

	l.		*s.*		*d.*
—— *A*	195	:	11	:	9 $\frac{1}{2}$
—— *B*	57	:	14	:	10 $\frac{1}{4}$
—— C	450	:	10	:	2
—— *D*	27	:	16	:	11 $\frac{3}{4}$
—— *E*	44	:	13	:	9 $\frac{1}{2}$
—— *F*	100	:	00	:	0
—— G	8	:	14	:	9 $\frac{1}{2}$
—— *H*	160		10	:	2 $\frac{1}{2}$
—— *I*	54	:	11	:	11
—— *K*	73	:	9	:	10 $\frac{1}{4}$
	1173	:	14	:	4 $\frac{1}{4}$

Then begin with the leaſt Denomination towards the Right hand, which is Farthings, ſaying, 1 and 2 is 3, and 2 is 5, and 2 is 7, and 3 is 10, and 1 is 11, and 2 is 13 Farthings, which is 3 Pence ¼, wherefore put down ¼ under the Farthings, and carry 3 Pence to the place of Pence, and ſay, 3 and 10 is 13, and 11 is 24, and 2 is 26, and 9 is 35, and 9 is 44, and 11 is 55, and 2 is 57, and 10 is 67, and 9 is 76. Now by your Table 72 Pence is 6 *s.* therefore 76 is 6 *s.* 4 *d.* wherefore put down 4 *d.* under the place of Pence, and carry 6 *s.* to the place of Shillings, ſaying, 6 that you carry and 9 is 15, and 1 is 16, and 4 is 20, and 3 is 23, and 6 is 29, and 4 is 33, and 1 is 34, wherefore put down 4 under the place of Shillings, and carry *Three Tens* to the place of *Tens of Shillings*, or *Angels*, and ſay, 3 that you carry and 1 is 4, and 1 is 5, and 1 is 6, and 1 is 7, and 1 is 8, and 1 is 9, and 1 is 10, and 1 is 11; now 11 Angels, or 11 ten Shillings is 5 *l.* 10 *s.* or 5 *l.* 1 Angel, therefore place 1 Angel under the Angels, and it makes the 4 to be 14 *s.* which place under the place of Shillings, and carry 5 Pound to the place of Pounds, and finiſh the Work as before directed; and the Total Sum found will appear to be 1173 *l.* 14 *s.* 4 *d.* ¼.

Example II.

A Banker on the Balance of his Books, finds himſelf indebted to L. 50 l. 10 s. 3 d. ¼. *to* M. 100 l. 10 s. 10 d. *to* N. 25 l. 7 s. 8 d. ¾. *to* O. 59 l. 17 s. *to* P. 507 l. 16 s. 10 d. ½. *to* Q. 7 l. 14 s. 9 d ¼. to R. 37 s. *to* S. 25 s. 11 d. ½. *to* T. 415 l. 10 s. 9 d. *to* V. 76 l. 13 s. 9 d. ½. *to* W. 100 l. *to* X. 15 s. 11 d. ½. *to* Y. 17 l. 17 s. *to* Z 10 l. 00 s. 4 d. ½.

l. s. d.

	l.	s.	d.
L	50	10	3 ¾
M	100	10	10
N	25	7	8 ¼
O	59	17	0
P	507	16	10 ½
Q	7	14	9 ¼
R	1	17	0
S	1	5	11 ½
T	415	10	9
V	76	13	9 2/4
W	100	00	0
X	00	15	11 ½
Y	17	17	0
Z	10	00	4 ½
Sum	1375	18	3 ¾

First of all add up your Farthings, as before directed, and they make 15, which is 3 d. ¾. place ¾ under the Farthings, and carry 3 Pence to the Pence, and ſay, 3 and 4 is 7, and 11 is 18, and 9 is 27, and 9 is 36, and 11 is 47, and 9 is 56, and 10 is 66, *at which* 10 *make a Comma*, becauſe 66 d. is 5 s. 6 d. then proceed and carry 6 d. to the next Figure, which is 8, and ſay 6 and 8 is 14, and 10 is 24, and 3 is 27. Now 27 d. is 2 s. 3 d. and the 5 s. before makes 7 s. 3 d. wherefore ſet down the 3 Pence under the place of Pence, and carry 7 Shillings to the place of Shillings, and proceed to finiſh your Summ as was taught you in the laſt precedent, and the Total Sum will appear to be 1375 l. 18 s. 3 d. ¾.

Addition

Addition of Averdupois *Weight.*

Note, *That* 16 *Drams is an Ounce,* 16 *Ounces is a Pound,* 28 *Pound is a Quarter of an Hundred,* 4 *Quarters is an Hundred Weight, conſiſting of* 112 *Pounds, and* 20 *Hundred is a Tun* Averdupois *Weight.*

The Marks or Characters by which this Weight is known or expreſſed are theſe, *viz. For Tuns (T.) Hundreds (C.) Quarters (Qr.) Pounds (℔.) Ounce (oz.) Drams (dr.)* As in the following Examples.

Tun	C.	*qr.*	℔.
25	14	2	24.
57	16	3	25.
42	10	1	17
96	14	2	27.
54	17	2	18.
59	16	3	22.
75	14	2	19.
64	17	3	26
478	04	0	10

C.	*qr.*	℔	*oz.*
154	1	19	10
275	3	19	11
476	2	10	07
57	3	14	08
45	1	10	10
17	2	22	11
45	3	17	09
76	2	19	14
1150	2	01	00

Let it be required to add up the Sum above, expreſſing *Tuns.* C. *qr.* and ℔. Firſt, add up the Pounds by making a Speck or Tittle at every 28 you find in the place of Pounds, as you may ſee in the above-mentioned Example, where is found to be ſix Specks, and 10 ℔ over, which 10 place under the Denomination of Pounds, and carry 6 to the Quarters, and add them up, they make 24, which is 6 C. for which put a (o) under the place of *qrs.* and carry 6 C. to the place of C. Then proceed to add up your C. after the ſame manner as you carry from Shillings to Pounds, becauſe 20 C. make a *Tun.*

Laſtly, Add up the *Tuns*, and the Total will appear to be 478 *Tun* 04 C. 0 *qr.* 10 ℔.

With *Troy-Weight* are weighed Bread, Gold, Silver, and Electuaries. And with *Averdupois-Weight* are weighed Butter, Cheeſe, Fleſh, Wax, Tallow, Pitch, Rozen, Lead, Iron, all ſorts of Grocery Wares, and all ſuch kind of Garble whence there may iſſue a waſte.

The Pound *Averdupois*, containing 16 Ounces, s equal to 14 *oz.* 12 *pw.* *Troy Weight*. And the Pound *Troy Weight*, conſiſting of 12 Ounces, is bout 13 Ounces, 2 Drams and a half of *Averdupois Weight*; ſo that he who tells you a Pound of Bread s as heavy as a Pound of Cheeſe, is very much miſtaken, the one being a Pound *Troy*, and the other Pound *Averdupois Weight*.

WOOL is alſo weighed with *Averdupois Weight*, but the Diviſions are ſomewhat different, *viz.* for Wool,

7 Pounds is a Glove, 2 Cloves is a Stone, 2 Stone is Todd, 6 Todds 1 Stone, 12 Stone is a Wey, 2 Weys is Sack, 12 Sacks is a Laſt of Wool.

Note, That according to the foregoing Diviſion, 82 ℔ is a *Wey*, but in ſome Countries the *Wey* is 56 ℔ *Averdupois*, as in *Suffolk*, &c. And in *Eſſex* here is 336 ℔ in a *Wey*.

Addition of Apothecaries *Weights*.

Apothecaries Weights are the ſame in the main with *Troy Weight*, only the Subdiviſions of the Pound are different, as followeth, *viz.*

Note, *That* 20 *Grains is a Scruple*, 3 *Scruples is a Dram*, 8 *Drams is an Ounce, and* 12 *Ounces is a Pound Weight*. The Marks or Characters by which Apothecaries Weights are known, are theſe, *viz.* *For Pounds* (℔) *Ounces* (℥) *Drams* (ʒ) *Scruples* (℈) *nd Grains* (*gr.*)

℔ 76

℔.	℥.	ʒ.	℈.	*gr.*
76	00	2	0	15
54	10	5	2	17
68	11	7	1	13
28	04	4	1	12
16	10	0	2	18
35	06	1	0	14
281	04	6	1	09

Addition of Troy-*Weight:*

Note, *That* 24 *Grains is a Penny-weight,* 20 *Penny-weight is an Ounce, and* 12 *Ounces is a Poun Troy-weight.*

The Notes or Characters by which *Troy-weight* i known, are theſe, *viz.* The Mark of Pounds i (℔) of Ounces (*oz.*) of Penny-weights (*pw.*) o Grains (*gr.*)

Let it be required to add the following Particulars together, *viz.* 24 ℔. 09 *oz.* 06 *pw.* 11 *gr.* an 164 ℔. 10 *oz.* 14 *pw.* 18 *gr.* and 82 ℔. 7 *oz.* 17 *p* 20 *gr.* and 8 ℔. 11. *oz.* 18 *pw.* 22 *gr.*

No

Now, in order to find out the Sum of theſe given Quantities, I place them one under another orderly, as you ſee in the Margent, and draw a Line under them. Then I begin with the Denomination of Grains, making a Prick with the Pen, at every 24 (for eaſe) and bear the overplus to the next above, ſaying, 22 and 20 is 42 which is 18 above 24, wherefore I make a Mark at 20, and carry the 18 up higher, ſaying 18 and 18 is 36, which is 12 above 24, wherefore I make a Mark at 18, and carry the 12 to the next above, ſaying, 12 and 11 make 23, which I put under the Line in its proper place, and obſerve how many Pricks I have made in the caſting up this Denomination, which I find to be 2, wherefore I carry 2 to the next, and proceed (as in the Shillings in *Addition of Money*, becauſe I carry 1 for every 20) ſaying, 2 and 8 is 10, and 7 is 17, and 4 is 21, and 6 is 27, and (then down again with the Tens) 10 is 37, and 10 is 47, and 10 is 57 Penny-weights; which is 2 *oz.* 17 *pw.* wherefore I put 17 *pw.* in its place under the Line, and carry the 2 *oz.* ſaying, 2 that I carry and 1 is 3, and 7 is 10, and 9 is 19, and 10 is 29, and 10 is 39 Ounces, which is 3 ℔. 3 *oz.* wherefore I put the 3 Ounces in its proper place under the Line, and carry the 3 ℔. to the Pounds and proceed to finiſh the Work as before is directed, which being done, I find the total Sum to be 281 ℔. 3 *oz.* 17 *pw.* 23 *gr.* as in the Margent.

℔	*oz.*	*pw.*	*gr.*
24	09	06	11
164	10	14	18.
82	07	17	20.
8	11	18	22
281	03	17	23

More Examples for Practice follow.

℔	oz.	pw.	gr.	℔	oz.	pw.	gr.
379	05	14	18.	297	10	07	13.
168	11	17	14	768	09	14	06
794	09	10	22.	635	11	18	21.
634	10	18	20.	74	08	18	19.
75	06	11	15.	35	10	14	14.
34	00	06	16	24	06	16	18
2087	09	09	09	1837	10	10	19

Addition of Liquid *Meaſure.*

The leaſt Denomination in *Liquid* Meaſure is a Pint, which was heretofore deduced from a Pound *Troy Weight*, a Pound of Wheat *Troy Weight* making a Pint *Liquid* Meaſure, but in regard of the Diſagreement thereof with the Rules of Solid Geometry in the gauging of Brewers Veſſels, ſome taking 288 ſolid Inches for a Gallon, ſome 286, *&c.* it occaſioned a difference between the Brewers and the Managers of his Majeſties Exciſe, 'till the Parliament taking the Matter into Conſideration, ordained that 282 ſolid Inches ſhould make the Gallon of Beer Meaſure, and the Gallon being ſubdivided into 2 Pottles, each Pottle into 2 Quarts, and each Quart into 2 Pints, ſo that the Pint being the Eighth Part of a Gallon, muſt contain 28 ſolid Inches and 7 eighth parts of an Inch for Wine Meaſure, and 35 ſolid Inches and a quarter for Beer Meaſure. *Wherefore* Note, *That* 35 ¼ *ſolid Inches make a Pint of Beer Meaſure,* 2 *Pints is a Quart, and* 2 *Quarts is a Pottle,* 2 *Pottles or* 282 *ſolid Inches a Gallon,* 8 *Gallons is a Firkin of Ale,* 9 *Gallons is a Firkin of Beer, and* 2 *Firkins is a Kilderkin, and* 2 *Kilderkins is a Barrel,* 1 ½ *Barrel, or* 54 *Gallons is a Hogſhead of Beer.*

In

In Wine *Meaſures.*

2 Pints is a Quart, 2 Quarts is a Pottle, 2 Pottles is a Gallon, 42 Gallons is a Tearce, or Third part of a Pipe or Butt, 63 Gallons is a Hogſhead, 2 Hogſheads is a Pipe or Butt, and 2 Pipes or Butts is a Tun of Wine.

☞ *Note,* Honey and Oil are meaſured by this Meaſure.

Examples of Wine *Meaſure.*

T.	*hhds.*	*gal*	*pts.*	*T.*	*hhds.*	*gal.*	*pts.*
37	3	18	5	240	1	48	3
48	2	24	0	196	3	22	1
67	1	20	6	97	3	51	5
38	2	17	7	85	2	17	6
79	0	47	3	43	0	25	0
64	1	52	4	93	1	38	5
355	3	55	1	757	1	14	4

Addition of Dry *Meaſure.*

The leaſt Denominative part of *Dry* Meaſure is a Pint, which is taken from *Troy Weight.*

With theſe are meaſured all dry Subſtances, as *Corn, Salt, Coal, Sand,* &c. The Table followeth.

In Dry Meaſure, Note, *That 2 Pints make a Quart, 2 Quarts a Pottle, 2 Pottles a Gallon, 2 Gallons a Peck, 4 Pecks a Buſhel* Land-Meaſure, *5 Pecks a Buſhel* Water-Meaſure, *8 Buſhels a Quarter, 4 Quarters a Chalder, and 5 Quarters a Wey.*

Note, 36 *Buſhels is a Chaldron of Sea-Coal in* London.

Examples of Dry *Meaſure.*

Chald.	*qrs.*	*buſh.*	*pec.*	*Chald.*	*qrs.*	*buſh.*	*pec.*
148	3	6	3	227	1	5	0
375	1	7	2	742	3	7	1
296	2	4	3	148	2	4	1
128	1	5	0	97	2	6	3
94	0	5	2	48	0	3	0
38	2	4	3	62	3	1	1
1082	1	2	1	1327	2	3	2

Addition of Long *Meaſure.*

Long Meaſure is originally deduced from a Barley Corn taken out of the middle of the Ear and well dried, from whence is deduced the following Table, *viz.*

In Long-Meaſure, Note, That 3 *Barley-Corns make an Inch,* 12 *Inches a Foot,* 3 *Foot a Yard,* 3 *Foot* 9 *Inches, or a Yard and a Quarter, is an Ell* Engliſh, 6 *Feet a Fathom,* 5 *Yards and an half, or* 16 *Feet and an half, make one Statute Pole, or Perch,* 30 *Poles or Perches make a Furlong, and* 8 *Furlongs make an* Engliſh *Mile.*

Examples of Long *Meaſure.*

Miles	*Fur.*	*Perch.*	*Miles*	*Fur.*	*Perch.*
48	7	24	134	3	18
37	3	18	342	4	24
65	3	28	179	5	16
36	5	00	84	0	25
107	1	07	76	7	27
205	6	17	84	2	13
501	6	04	902	1	03

Addition of Cloth *Meaſure.*

Note, *That* 4 *Nails, or* 9 *Inches make a quarter of a Yard,* 3 *quarters of a Yard make an Ell* Flemiſh, 4 *quarters a Yard* Engliſh, 5 *quarters of a Yard, or* 45 *Inches is an Ell* Engliſh.

Examples of Cloth *Meaſure.*

Yds.	*qrs.*	*na.*	*Ells*	*qrs.*	*na.*	*Ells fl.*	*qrs.*	*na.*
137	3	3	376	2	0	184	1	2
295	1	2	378	3	3	357	2	1
112	2	3	742	3	1	475	2	2
215	0	1	97	2	2	251	1	0
174	1	2	84	1	2	164	0	2
764	3	0	63	0	3	87	1	3
1700	0	3	1547	3	3	1521	0	2

Addition of Land *Meaſure.*

From the foregoing Table of Long Meaſure, is alſo Superficial Meaſure deduced, that of Land Meaſure being as follows, *viz.*

In Land Meaſure, 40 Square Poles or Perches make a Rood, and 4 Roods make an Acre.

Examples of Land *Meaſure.*

Acr.	*Rood.*	*Per.*	*Acr.*	*Rood.*	*Per.*	*Acr.*	*Rood*	*Per.*
120	2	34	164	1	20	320	3	10
275	3	14	130	3	25	180	1	19
162	1	35	644	2	17	672	3	28
98	2	20	563	0	24	191	0	12
47	3	30	372	3	18	634	1	15
64	1	25	140	1	26	87	2	14
769	3	28	2016	1	10	2087	0	18

Of TIME.

The Denominative parts of Time are originally deduced from the Sun's Motion in the Heavens, which is carried round the ſame from *Eaſt* to *Weſt* by the Rapid Motion of the *Primum Mobile* in one Day Natural, which Day is divided into 24 ſuppoſed equal parts, called Hours, and each Hour is ſubdivided into 60 Minutes, *&c.* whence ariſeth the following Table, *viz.*

In *Time*, Note, That 60 *Minutes makes an Hour*, 24 *Hours make a Natural Day*, 7 *Days make a Week*, 4 *Weeks make a Month. conſiſting of* 28 *Days*, 13 *Months* 1 *Day and* 6 *Hours make a Year.*

However, in the ordinary Computation of Time, the Year is divided into 12 unequal Kalendar Months. whoſe Names, and the Numbers of Days that each containeth, are as followeth, *viz.*

	Days		Days
January	31	*July*	31
February	28	*Auguſt*	31
March	31	*September*	30
April	30	*October*	31
May	31	*November*	30
June	30	*December*	31

Note, That the 6 odd Hours is reckoned but once in 4 Years, and the one whole Day is added to that Year making it to conſiſt of 366 Days, and is call'd *Leap-Year*; the ſaid Day is added to *February*, which then containeth 29 Days

Note alſo, *That the Minute is uſually ſubdivided into 60 Seconds, and each Second into 60 Thirds*, &c.

The Tropical Year, or the time the Sun leaves the Tropick, till the Time it returns to it again, by the Obſervations of the moſt Accurate Aſtronomers, is found to conſiſt of 365 *Days*, 5 *Hours*, 49 *Minutes*, 4 *Seconds*, and 21 *Thirds*.

CHAP. III.

Of SUBTRACTION.

I. SUBTRACTION *Teacheth to take a leſſer Number from a greater, or an equal from an equal; whereby we diſcover the* Remainder, Exceſs, *or* Difference.

II *In Subtraction*, if the Numbers given be Integers, that is, conſiſting of one Denomination, then place the biggeſt Number uppermoſt, and the leſſer in order under it, *viz* Units under Units, Tens under Tens, Hundreds under Hundreds, *&c.* And draw a Line under them.

III Then begin at the Place of Units, taking the lowermoſt Figure out of the uppermoſt, and place the Remainder under the Line, then proceed to the place of Tens, and do in the ſame manner, and then to the place of Hundreds, *&c.* till the whole Work be finiſh'd: Then ſhall the Number under the ſaid Line be the Remainder or Difference.

Example.

Let it be required to find the Difference between 48 *and* 16 ?

Firſt, I put down the biggeſt Number, 48, and place 16 the leſſer Number under it, and under both I draw a Line, as you ſee in the Margent; then I begin at the place of Units, ſaying 6 out of 8 and there remains 2, which I place under the Line, and proceed to the next place, ſaying, 1 from 4 and there remains 3 which I likewiſe place under the Line, and the Work is finiſhed. So that I find the Remainder or Difference between 48 and 16 to be 32, as you may ſee by the Work in the Margent.

48
16
—
32

More Examples of the like Nature follow.

From	743	586	3785	1842
Subtr.	121	270	205	342
Remains	622	316	3580	1500

But if the particular Figure which you are to *Subtract*, be greater than the Figure out of which it is to be *Subtracted*; then you are to borrow 10, and add it to the uppermoſt Figure, and then *Subtract* the ſaid lowermoſt Figure, from their Sum, and place the *Remainder* underneath the Line, and for that which you borrowed, add 1 to the next Figure in the lowermoſt Line, and proceed. Let this be repeated as often as there is occaſion.

Example.

Example.

Let it be required to Subtract 3872 *from* 43758.

The given Numbers being placed, and a Line drawn under them, as is before directed, I begin at the right hand, ſaying, 2 from 8, and there remains 6, which I ſet under the Line, and proceed, ſaying, 7 from 5 I cannot, but 7 from 15 and there remains 8, which I put under the Line; and proceed to the next, ſaying, 1 that I borrow'd and 8 is 9 from 7 I cannot, but 9 from 17 and there remains 8, which I put under the Line, and proceed to the next Figure, ſaying, 1 that I borrowed and 3 is 4, from 3 I cannot, but 4 from 13 and there remains 9, which I put under the Line; now becauſe there is no Figure ſtanding under the 4, I therefore ſuppoſe, a (o) Cypher to be placed there, and becauſe I borrowed 1 at the laſt Figure, therefore I pay it here by Subtracting it out of the 4, ſaying 1 that I borrowed out of 4 and there remains 3, which I put under the Line, and the Work is finiſhed; and I find (after the Work of Subtraction is ended) the ramainder to be 39886. Theſe Examples being well underſtood, will render what follows to be plain and eaſie.

43758
3872
———
39886

From	7458	50876	10008576
Subtr.	467	947	8743
Remains	6991	49929	9999833
From	5100	30210	15764
Take	1754	10325	7275
Reſt	3346	19885	8488
Proof	5100	30210	15764

The Proof of Subtraction.

For Proof of Subtraction, add the Reſt, or Remainder, to the Number Subtracted, and if the Sum be equal to the uppermoſt Number (*being the Number from whence Subtraction is made*) your Work is true, otherwiſe falſe, as you may ſee in the laſt Example of Subtraction above-mentioned.

Subtraction of Money.

IV. If the given Numbers conſiſt of divers Denominations, ſuch as *Money*, *Weight*, *Meaſure*, *Time*, &c. then you are to place the leſſer Number under the greater, in ſuch ſort that each Denomination may ſtand under its correſpondent Name, as has been directed in *Addition*, and draw a Line under them.

Then proceed to Subtract the undermoſt from the uppermoſt, beginning at the leaſt Denomination, and proceeding gradually towards the Left hand, ſetting the *Remainder* of each Denomination under the Line until the whole be finiſhed: As for Example:

Let it be required to Subtract 129 *l.* 07 *s.* 04 *d.* $\frac{1}{4}$ from 254 *l.* 13 *s.* 10 *d.* $\frac{3}{4}$. Firſt, I place them down, the leſſer under the greater, and draw a Line under them, as you ſee in the Margent.

l.	*s.*	*d.*	*f.*
250 -	13 -	10	$\frac{3}{4}$
129 -	07 -	04	$\frac{1}{4}$
121 -	06 -	06	$\frac{1}{2}$

Then I begin at the Right hand ſaying, 1 Farthing from 3 Farthings and there remains 2, which I put under the Line in the Place of Farthings, and proceed to the Denomination of Pence, ſaying, 4 from 10 and there remain 6, which I put under the Line in the place of Pence, and then I go to the Denomination of Shillings, ſaying, 7 from 13 and there reſt 6, which I put under the Line in the place of Shillings and then I proceed to finiſh the Work according to the third Rule of this Chapter; which being ended I find the Remainder to be 121 *l* 06 *s*. 06 *d*. ½. as you ſee in the Margent.

V. But if the lowermoſt Number in any of the Denominations chance to be greater than the uppermoſt, you muſt in ſuch caſe borrow an Unit from the next greater Denomination, ſubtracting the lowermoſt Number therefrom, and *adding the Remainder* to the ſaid uppermoſt Number, and place that Sum under the Line; and then proceed, adding one to the next lowermoſt Number to the left Hand for that you borrowed, *&c.*

A few Examples will make this Rule very plain.

l	*s.*	*d.*
348 :	12 :	07 ¾
178 :	15 :	09 ¼
169 :	16 :	10 ½

Let it be required to ſubtract 178 *l.* 15 *s.* 9 *d* ¼. from 348 *l.* 12 *s.* 7 *d.* ¾. Firſt, I place them down in order, as has been before directed, and draw a Line under them. Then I begin at the right Hand with the Denomination of Farthings; ſaying 1 from 3 and there remains 2, which I put under the Line, and proceed to the Denomination of Pence, ſaying, 9 Pence out of 7 Pence I cannot, but (borrowing own from the next Denomination, which is Shillings, and makes 12 Pence, I ſay) 9 from 12 and there remains 3, which I add to the 7 Pence and that makes 10 Pence, wherefore I put 10 Pence under the Line, and proceed to the next Denomination, which is Shillings, and ſay, 1 that I borrowed, and 15 is 16 from 12 I cannot, but (borrowing 1 Pound from the next Denomination, which is 20 Shilling,) 16 from 20 and there remains 4, which added to the ſaid 12 makes 16 Shillings, which I ſet down under the Line, and proceed to the Pounds, ſaying, 1 that I borrowed and 8 is 9 from 8 I cannot, but 9 from 18, *&c.* And the Work being finiſhed, I find the Remainder to be 169 *l.* 16 *s.* 10 *d.* ½ as appears by the Work in the Margent.

Examples.

Examples for Practice.

	l.	*s.*	*d*	*f.*	*l.*	*s.*	*d.*	*f.*
Received	295	11	03	¼	415	00	05	½
Paid	107	14	09	½	107	11	08	¾
Reſt	178	16	05	¾	307	08	08	¾
Proof	295	11	03	½	415	00	05	½
Debtor	100	00	00		1072	01	05	
Creditor	75	00	09		107	16	10	½
Ballance	24	19	03		964	04	06	½
Proof	100	00	00		1072	01	05	
Received	1010	10	10		100	00	09	½
Disburſt	942	13	11	½	47	00	10	
Reſt	67	16	10	½	52	19	11	½
Proof	1010	10	10		100	00	09	½

VI. If a Sum be lent, and Payment thereof made at ſeveral times in part, and you would know how much remains due, in this caſe you muſt add the ſeveral Payments into one Sum, and ſubtract that Sum from the Sum lent, and the Remainder will ſhew how much is due. An Example or two will make it plain and eaſie.

Lent

	l.	s.	d.	l.	s.	d.
Lent	3475	10	05	572	11	05
Paid at ſeveral times	358	14	07 ½	154	09	07 ¼
	514	07	11 ¾	95	10	07
	294	16	09	6	14	05 ½
	344	10	08 ½	72	11	04
	365	15	10 ¼	16	17	02
	795	15	07 ¼	9	14	11 ½
	462	14	08	164	17	09
Paid in all	3136	16	02 ¼	520	15	10 ¼
Reſts due	338	14	02 ¾	51	15	06
Proof	3475	10	05	572	11	05

Examples.

	l.	s.	d.
Lent	4768	17	10 ¼
Received at ſeveral Times.	347	14	06 ½
	785	11	11 ¾
	128	15	09 ¼
	420	16	05
	124	00	02 ¾
Received in all	1806	18	11 ¼
Remains due	2961	18	11

	l.	s.	d.	l.	s.	d.
Borrowed	3475	10	05	4620	00	00
Paid at ſeveral times	958	14	07 ½	409	09	10
	514	07	11 ¾	276	15	07 ¼
	294	16	09	195	13	11 ¾
	344	10	08 ½	167	19	12 ½
	365	15	10 ¼	984	19	05 ¼
	792	05	06 ½	785	07	06
Paid in all	2670	11	05 ½	2820	03	02 ¾
Reſts due	804	18	11 ½	1799	16	09 ¼
Proof	3475	10	05	4620	00	00

Let us prove the *Example* of the Fifth Rule in Subtraction of Money, where it is required to Subtract 178 *l.* 15 *s.* 9 *d.* ¼. from 348 *l.* 12 *s.* 7 *d.* ¾.

	l.	s.	d.
From	348	12	07 ¾
Subtr.	178	15	09 ¼
Remain	169	16	10 ½
Proof	348	12	07 ¾

In this Example the Remainder is found to be 169 *l.* 16 *s.* 10 *d.* ½, which I add to 178 *l.* 15 *s.* 9 *d.* ¼. (the Number given to be ſubtracted) and the Sum is 348 *l* 12 *s.* 7 *d.* ¾. which is equal to the uppermoſt of the given Numbers, wherefore I conclude the Subtraction to be truly wrought.

Subtraction of Averdupois-*Weight.*

A Salter buys 45 Tun, 7 C. 1 qr. 12 ℔. *of Logwood, of which he ſold* 19 Tun, 14 C. 1 qr. 18 ℔.

In order to the Work, I diſpoſe of the given Numbers according to the Directions of the Fourth Rule of this Chapter, drawing a Line under them, as you ſee in the Example.

Tun.		C.		q.		℔.
45	:	07	:	1	:	12
19	:	14	:	1	:	18
25	:	12	:	3	:	22

Then I begin at the right Hand, which is Pound weights, ſaying, 18 out of 12 I cannot, but 18 out of 28 (borrowing a *qr.* of a C. (*which is* 28 ℔.) and there remains 10, to which add the 12 ℔, it makes 22 ℔, which I place under the ℔. and carry 1 to the quarters, and ſay, 1 that I borrowed and 1 is 2, now 2 quarters, out of 1 I cannot, but 2 out of 4 quarters, (*which is a* C. *weight*) there remains 2, to which add the 1 quarter, it makes 3, which I place under the qrs. and proceed to the C. and ſay, 1 that I borrowed and 14 C. is 15 C. now 15 C. out of 7 C. I cannot, but 15 C. out of 20 C. (*which is 1 Tun*) there remains 5, to which add the 7 C. it makes 12 C. which I place under the C. and proceed to the Tuns, and ſay, 1 that I carried and 9 is 10, 10 out of 5 I cannot, but 10 out of 15, reſt 5, and carry 1, and ſay, 1 that I carry and 1 is 2, 2 out of 4 and there remains 2, and the Work is finiſhed, and I find the *Remainder* or *Difference* to be 25 *Tun,* 12 C. 3 *qrs,* 22 ℔.

More Examples for the Learners Practice.

	Tun.	C.	*qr.*	℔.	C.	*qrs.*	℔.
Bought	107	10	2	05	74	0	15
Sold	94	17	3	10	19	1	11
Reſt	12	12	2	23	54	3	04
Proof	107	10	2	05	74	0	15

	C.	*qrs.*	℔.	C.	*qrs.*	℔.
Bought	194	3	27	454	1	17
Sold	99	2	16	196	3	22
Unſold	95	1	11	257	1	23
Proof	194	3	27	454	1	17

If ſeveral Quantities in *Groſs Weight* be given, out of which you would Subtract the *Tare*, in ſuch a Caſe add the *Groſs Weight* into one Total: And add the *Tare* likewiſe into one Total, Then Subtract the Total of the *Tare* from the Total of the *Groſs*, the Remainder is *Neat* Weight.

Example.

Example.

A Merchant ſells 6 *Hogſheads of* Sugar, *viz.*

	C.	*qrs.*	℔.
N°. 1 Gr.	14	2	10
———	7	1	19
———	16	2	14
———	17	1	10
———	18	2	17
6———	14	1	22
Groſs	99	0	03
Tare	12	3	24
Reſt Neat	86	0	12

	C.	*qrs.*	℔.
Tare	1	3	15
	2	0	05
	2	1	10
	2	1	16
	2	1	12
	1	3	22
Tare	12	3	24

Subtraction of Troy *Weight.*

	oz.	*pw*	*gr.*	*oz.*	*pw.*	*gr.*
Bought	115	07	05	976	11	06
Sold	94	3	10	149	14	11
Reſt	20	13	19	826	16	19
Proof	115	07	05	976	11	06

	℔.	*oz*	*pw.*
ought	375	05	13 ½
old	196	10	17 ¼
Reſt	178	06	16 ¼
roof	375	05	13 ½

℔.	*oz.*	*pw.*	*gr.*
194	3	09	16
95	7	14	18
98	7	14	22
194	3	09	16

I might proceed to give Examples in Subtractio of Liquid Meaſure, Dry Meaſure. Long Meaſur Apothecaries Weights, Time, Motion, &c b there being no more Difference between the wor ing of theſe and thoſe Examples, than only obſe ving the Tables of each, which are delivered i the Second Chapter, therefore I forbear, this bei ſufficient for the meaneſt Capacity.

CHAP. IV.

Of MULTIPLICATION.

I. IN *Multiplication* there are always Two Nu bers given to find out a Third, which ſh contain either of the given Numbers as many tim as the other containeth an Unit.

II. Of the Two Numbers given, the one is ca led the *Multiplicand*, and the other is called th *Multiplier*, and the Number found out by the Op ration is called the *Product*.

III. The *Multiplicand* is the Number given to be multiplied, and is uſually, for Order's ſake, th bigeſt of the Two given Numbers.

IV. The *Multiplier* is that by which the *Multi plicand* is multiplied, and is uſually the lea Number.

V. The *Product* is the Number produced by th Multiplication, and it containeth the *Multiplier* a many times as the *Multiplicand* containeth Units

o

r it containeth the *Multiplicand* as often as the *ultiplier* containeth Units.

VI *Multiplication* is either Simple or Compound.

VII. *Simple Multiplication* is when the *Multipli-* *nd* and the *Multiplier*, do each of them conſiſt f one ſingle Figure only: As if it were required multiply 4 by 3, 5 by 2, 9 by 7, *&c.* Here times 4 is 12, and 2 times 5 is 10, and 7 times 9 63; now 12, 10 and 63, are the *Products* of each *ultiplication.*

VIII. All the Variety of *Simple Multiplication* is ntained in the following Table, which muſt be arn'd by heart, before the Learner can make any rther Progreſs.

Multiplication

Multiplication TABLE.

2 times	2 is	4
	3	6
	4	8
	5	10
	6	12
	7	14
	8	16
	9	18
	10	20
	11	22
	12	24
3 times	3 is	9
	4	12
	5	15
	6	18
	7	21
	8	24
	9	27
	10	30
	11	33
	12	36
4 times	4 is	16
	5	20
	6	24
	7	28
	8	32
	9	36
	10	40
	11	44
	12	48
5 times	5 is	25
	6	30
	7	35
	8	40
	9	45
	10	50
	11	55
	12	60
6 times	6 is	36
	7	42
	8	48
	9	54
	10	60
	11	66
	12	72
7 times	7 is	49
	8	56
	9	63
	10	70
	11	77
	12	84
8 times	8 is	64
	9	72
	10	80
	11	88
	12	96
9 times	9 is	81
	10	90
	11	99
	12	108

IX. *Compound Multiplication* is when the *Multipli- and*, or *Multiplier*, or both of them, do conſiſt of *ompound Numbers*, that is, of more Figures or laces than one.

As if it were required to multiply 324 by 2, here he *Multiplicand* is 324, which conſiſteth of 3 pla- es. and the ***Multiplier*** is 2.

X. When it is required to multiply one Number y another, firſt ſet down the biggeſt Number for he *Multiplicand*, and under that the *Multiplier* in uch Order as has been taught in Addition and Sub- action, *viz.* Units under Units, Tens under Tens, *c.* and draw a Line under them.

As if it were required to multiply 324 by 2, I et them down as followeth, *viz.*

The *Multiplicand* 324
The *Multiplier* 2

Then I begin with the Place of Units, ſaying, times 4 is 8, which I put under the Line; then times 2 is 4, which I alſo put under the Line; nd 2 times 3 is 6, which I alſo put under the ine; and the Work is finiſhed: So that I find 324 eing multiplied by 2, produceth 648, as by the llowing Work.

The *Multiplicand* 324
The *Multiplier* 2
The *Product* 648

XI. When the *Product* of any ſingle Figure mounts to 10, or a certain Number of Tens, then ou are to ſet down a Cypher and carry an Unit r every Ten to the Product of the next Figure; if it comes to above 10, or any Number of Tens, then ſet down the Exceſs, and carry an Unit fo every Ten, *&c.* as in the following Example.

Let it be required to multiply 785641 *by* 5.

The Number being ſet down according to th Tenth Rule, I begin, ſaying, 5 times 1 is 5, which I put under the Line, and proceed, ſaying, 5 times 4 is 20, wherefore I put down 0, and carry 2 for the 2 Tens to the next, ſaying, 5 times 6 is 30, and 2 that I carried is 32, wherefore I put down 2 and carry 3 from the 3 Tens to the next Figure, ſaying, 5 times 5 is 25, and 3 that I carried is 28 wherefore I pu down 8, and carry 2 to the next, ſaying, 5 times 8 is 40, and 2 that I carry is 42, ſo I put down 2, and carry 4 to the next Figure, ſaying, 5 times 7 is 35, and 4 that I carry is 39, which being the laſt Figure I put down 39 under the Line, and ſo the Work is finiſhed, and I find that 785641 being multiplied by 5, the Product is 3928205, as appea by the whole Work in the Margin.

785641
5
———
3928205

And here, by the way, Note, *That Multiplication is a Compendious Performance of Addition*; for in the laſt Example, if inſtead of multiplying 785641 by 5, I put down the Multiplicand 5 times in order one under the other, and add them all together, then will the Sum of them amount to the Product that was found by the foregoing Work of Multiplication, as appears by the Work in the Margin. The ſame may be performed by any other Example.

785641
785641
785641
785641
785641
———
3928205

Other Examples for this Rule for Practice may e ſuch as follow.

748046	570084	7115083
4	6	8
2992184	3420504	56920664
72190	35726	145796
9	5	10
649710	178630	1457960

XII. When the *Multiplier* conſiſts of divers Pla-s, then muſt there be as many *particular Products* there are places therein, and for the true placing each Product, obſerve to put the firſt Figure or ace of Units under its proper *Multiplier*, and when u have done, draw a Line under the whole Work, d add the *ſeveral Products* together, and their Sum ill be the total Product required.

Example I.

Let it be required to Multiply 46753 *by* 46.

```
 46753
    46
------
280518
87012
------
50638
```

Having placed the given Numbers in order to e Work, according to the Tenth Rule of this Chapter, and drawn a Line under them, as you ſee in the Margin I begin to Multiply with the 6, ſaying, 6 times 3 is 18, wherefore I put down 8 under the Line, and carry 1 to the next, ſaying, 6 times 5 is 30, and 2 that I carry is 32, *&c.* ſo that the Product by 6 is 280518. Then I begin with the 4, ying, 4 times 3 is 12, wherefore I put down (under the Line, and under the Figure 4, by which I multiply) and carry 1 for the Ten to the next, ſaying, 4 times 5 is 20, and 1 that I carry is 21; wherefore I ſet down 1, and carry 2 to the next, *&c.* and I find the ſingle Product by 4 to be 187012, and ſo the Multiplication is ended: Then I draw a Line under theſe Two particular Products, and add them together in the Order as they ſtand, and the Sum is 2150638, which is the true Product of 46753 being multiplied by 46, that is, 46 times 46753, is 2150638, and is equal to the Sum of 46753, being ſet 46 times one under another and added together. Behold the whole Work of Multiplication in the Margin.

Example II.

Let it be required to multiply 5800846 *by* 478.

Firſt, I diſpoſe of the given Numbers in order to the Operation, according to the Tenth Rule foregoing.

Then I begin and multiply the whole *Multiplicand* by (the firſt Figure of the *Multiplier*) 8, and the Product thereof is 46406768; then I multiply the ſame again (by the ſecond Figure of the Multiplier) 7, and the Product thereof is 40605922, the firſt Figure whereof, *viz.* 2. I place under the 7 by which I multiply. Then I proceed to multiply by 4, and the Product thence ariſing is 23203384; the firſt Figure whereof, which is 4, I place under 4, by which I multiply, and all the reſt in their Order, and ſo the whole Work of *Multiplication* is finiſhed: Then I draw a Line under all, and add up the ſeveral Products, and their Sum is 2772804388, which is the Total Product.

$$\begin{array}{r}
5800846 \\
478 \\
\hline
46406768 \\
40605922 \\
23203384 \\
\hline
2772804388
\end{array}$$

A General Rule in Multiplication is chiefly to obſerve, That in whatſoever place the Figure of the Multiplier (whether a Cypher or Cyphers) ſtands from the place of Units, in the ſame place muſt the firſt Figure of that Multiplication be ſet from the Unit of the Multiplicand.

And ſince the greateſt Difficulty in Multiplication ariſes from having a Cypher or Cyphers in the Multipliers, I ſhall endeavour to make it plain and eaſie by the following Examples.

Example I.

Where there is one or more Cyphers in the Multiplier betwixt ſignificant Figures.

(2)	(1)
45793	8465008
507	4006
320551	50790048
2289650	33860 3200
23217051	33910822048

In the firſt Example, you ſee that the Cyphers are put at the ſame Diſtance from the Unit of the Multiplicand that they ſtand in from the Unit of the Multiplier; as 4. the Fourth Figure of the Multiplier (the firſt Figure in that Multiplicand, which is 2) is ſet in the Fourth place from the Unit of the Multiplicand.

Example II.

Where the Multiplier hath one or more Cyphers to the Right hand thereof.

(1)

546735
4620

10934700
3280410
2186940

252 915700

(2)

7645932
48000

61167456
30583728

367004736000

Or, *You may multiply by the ſignificant Figures,* neglecting the Cyphers (*as in the ſecond Sum*) *as if there were none, only to the Product annexed as many Cyphers as there were Cyphers in the Multiplier.*

Example III.

Where the *Multiplicand* and *Multiplier* have each of them Cyphers at the Right hand.

(1)

58400
760

3504000
408800

44384000

(2)

438700
67000

30700
26322

29392900000

Or, *You may* neglect the Cyphers (*as in the ſecond Sum*) *only to the Product annex as many Cyphers as there were Cyphers to the Right hand of the Multiplicand and Multiplier.*

XIII. When the *Multiplier* conſiſts of a Unit in the higheſt place towards the Left hand, and all the reſt Cyphers towards the Right-hand, as 10, 100, 1000, *&c.* then is the whole Work performed by annexing the Cyphers of the Multiplier to the Figures of the Multiplicand; as in the following Examples.

6507	6507	6507
1000	100	10
6507000	650700	65070

XIV. *It is neceſſary for all ſuch as would be dextrous and ready at* Arithmetick *to learn to multiply by theſe Compound Numbers following very readily at one Operation*, viz.

Ex. Mult.	574967	Mult.	842958
by	11	by	12
fa.	6324637	*fa.*	10115496
	345786		859427
	110		120
Product	38036460	*fa.*	103131240
	7504675		3217295
	12		12
	90056100		38607540

Here 574967 is multiplied by 11 thus, 11 times 7 is 77, put down 7, and carry 7, and then 11 times 6 is 66, and 7 I carry is 73 put down 3, and carry 7, then 11 times 9 is 99, and 7 I carry is 106, put down 6, and carry 10; then 11 times 4 is

44, and 10 I carry is 54, put down 4 and carry 5; then 11 times 7 is 77, and 5 is 82, put down 2, and carry 8, then 11 times 5 is 55, and 8 I carry is 63, which put down to the Product of 574967 multiplied by 11 is found to be 6324637.

In like manner to multiply 8 2958 by 12, ſay, 12 times 8 is 96, put down 6, and carry 9, then 12 times 5 is 60, and 9 I carry is 69, put down 9 and carry 6, and ſo proceed till you have gone through your Sum.

To multiply any Number by 110, or 120, put down a Cypher, and multiply as before.

Multiply	425760	Multiply	543760
by	12000	by	1200
Product	510912000	*fa.*	652512000

The Proof of Multiplication.

XV. When you would prove the Truth of your Work in Multiplication, firſt, with your Pen make a Croſs, then add the Figures of the Multiplicand together, not conſidering their Value as to the places they poſſeſs, but as if they were all Units, caſting away the Nines as often as may be, and put the laſt Remainder on the Left ſide of the Croſs made for that Purpoſe, then likewiſe add the Figures in the *Multiplier* together, caſting away the Nines as often as may be, and put the laſt Remainder on the right-ſide of the Croſs; then multiply theſe two Remainders one by another, and caſt away all the Nines out of their Product, and put the Remainder above the Croſs; then add together the Figures of the Product, caſting away the Nines as often as may be, and put the laſt Remainder under the Croſs, and then look if the Figure above the Croſs, and the Figure below the Croſs be equal, then is your Sum rightly performed, otherwiſe not.

As for Example : Let it be required to multiply 587464 by 465 ; when the Work is finiſhed, I find the Product to be 273170760, as by the following Work appears.

$$\begin{array}{ccc} & 6 & \\ 7 & + & 6 \\ & 6 & \end{array}$$

$$\begin{array}{r} 587464 \\ 465 \\ \hline 2937320 \\ 3524784 \\ 2349856 \\ \hline 273170760 \end{array}$$

Now to prove whether the Work be rightly perform'd, I firſt make a Croſs as you ſee above, and then begin to add the Figures of the *Multiplicand* together, ſaying, 5 and 8 is 13, caſt away 9 and there reſts 4 ; then 4 and 7 is 11, caſt away 9 and there reſts 2 ; then 2 and 4 is 6, and 6 is 12, caſt away 9 and there remains 3 ; then 3 and 4 is 7, which I put down on the left ſide of the Croſs : Then I add together the Figures of the *Multiplier*, as I did thoſe of the *Multiplicand*, and the laſt Remainder there is 6, which I put on the right ſide of the Croſs ; then do I multiply theſe two Figures together which ſtand on each ſide of the Croſs, *viz.* 6 and 7, and their Product is 42, out of which I caſt the Nines as often as may be, and there remains 6, which I put on the top of the Croſs. But the eaſieſt way to caſt the Nines out of any Number, is to add the Figures together which conſtitute that Number, and their Sum is the Remainder when the Nines are caſt away as often as may be, ſo in this Example the Nines are eaſily caſt out of 42 (which is the Product of 6 by 7) for 42 is conſtituted of 4 and 2, whoſe Sum is 6; but if the ſaid Sum chance to come to more than 9, caſt 9 out of it, and put down the Remainder, ſo 8 times 7 is 56, the Sum of which Figures (5 and 6) is 11, out of which taking 9 there reſts 2, which is the true Remainder when the Nines are caſt out of 56 as often as may be.

Now in this Example, having put the ſaid Remainder 6, above the Croſs, I proceed to caſt away the Nine out of the Product, and there remains 6 likewiſe, which I put below the Croſs, and becauſe the Figure above and below the Croſs are equal, *viz.* each 6, I conclude the Work to be truly performed.

But the true Proof of *Multiplication* is by *Diviſion*, as ſhall be taught in that Rule, this way by caſting away the Nines many times proving the Work to be true, when it is abſolutely falſe, but when it proveth not true this way, the Sum cannot be right.

CHAP. V.

Of DIVISION.

DIVISION *Teacheth to Divide any given Number into as many equal parts as you pleaſe.* Or,

It is that by which we diſcover how often one Number is contained in another.

II. In *Diviſion* there are always Three Numbers *certain*, and a fourth *accidental.*

III. Of the Three Numbers certain, Two are always given to find out a Third; *viz.* The one of the Numbers given is to be *Divided*, the other Number given, is that by which the firſt is *Divided*, and the

Number found out is the *Quotient*, and diſcovers how often the one Number is contained in the other.

IV. Therefore in this Rule are three remarkable Numbers, *viz.* The *Dividend*, the *Diviſor*, and the *Quotient.*

(1) The *Dividend* is the Number given to be divided into equal parts.

(2) The *Diviſor* is the Number given by which the *Dividend* is to be divided, which declareth into how many equal parts the *Dividend* is to be divided.

(3) The *Quotient* is the Number *Invented* by the Operation, and ſhews *how often* the *Diviſor* is contained in the *Dividend.*

And the *Remainder* is the Number which remains after the *Diviſion* is ended, which is uncertain, and is the Fourth accidental Number, I mentioned before.

As ſuppoſe 15 were given to be divided by 3, or 15 Shillings to be divided amongſt 3 Men, here 15 is the *Dividend*, 3 is the *Diviſor*, and 5 is the *Quotient*, for 3 is contained in 15 juſt 5 times, without any *Remainder*; but if you were to divide 20 by 3, the *Quotient* would be 6, and the *Remainder* 2, for 3 is contained in 20, 6 times, and 2 remains over.

In *Diviſion* (*by one Figure*) you are firſt to write down the *Dividend*, and then draw a crooked Line, and place the *Diviſor* on the Left hand thereof, then draw a Line under the *Dividend*, under which place your *Quotient.*

Example.

Let it be required to divide 45 by 9, here the *Quotient* is 5, becauſe 9 is contained in 45, 5 times, and theſe ought to be placed as followeth.

Dividend

Dividend
Diviſor 9) 45
Quotient 5

V. When a Number is given to be divided by a *ſingle* Figure or Digit, if the firſt Figure of the *Dividend* viz. (*that on the left hand*) be bigger, or at leaſt equal to the *Diviſor*, you are to put a Point or Prick under the ſame, and proceed as followeth.

Example.

Suppoſe it were required to divide 6788 by 4, the given Numbers are placed as before directed, making a Prick under (6) the firſt Figure of the *Dividend*, which for Diſtinction ſake may be called the *Dividual*, as followeth.

Dividend
Diviſor 4) 6788
Quotient 1697

Note, In every *Diviſion* you are to obſerve this Method; firſt, to *Seek*, ſecondly, to *Multiply*, thirdly, to *Subtract*.

As in the laſt Example, after you have writ down your *Dividend* and *Diviſor*, as was ſhewed you, firſt ſeek how often (or how many times) 4 which is the *Diviſor*, can you have in 6, which is the firſt Figure of the *Dividend* towards the Left-hand; the Anſwer is once; which I place in the *Quotient* exactly under the 6 (as you ſee in the Operation of the Sum) and ſay, once 4 out of 6, there will remain 2, which 2 is two tens to the next Figure 7, and makes the new *Dividual* 27. Then ask again (*or ſeek*) how often 4, the *Diviſor*, can you have in 27 ? *Anſwer*, 6 times, which 6 place in the *Quotient* under 7, the ſecond Figure of the *Dividend*, then take 6 times 4, which is 24 out of 27, there will remain 3, which is three Tens to 8, the third Figure of the *Dividend*, and makes it 38. Then ask again, how many times 4 can you have in 38? *Anſwer*, 9 times; which 9 place in the *Quotient* under 8, the third Figure of the *Dividend*; then take 4 times 9, which is 36, out of 38, there will remain 2, which is two Tens to the fourth and laſt Figure of the *Dividend*, and makes the 8 to be 28: Then *laſtly*, Seek how often the *Diviſor* 4 can you have in 28; *Anſwer*, 7 times, which I place under 8, the laſt Figure of the *Dividend*, and your Work is done; the *Quotient* being found to be 1697, which is the Number of times the *Diviſor* 4 is found in the *Dividend* 6788. Or if the ſaid Sum were to be divided between 4 Men, each Man's Share would be 1697 Pounds.

But to make this plain to any ordinary Capacity, I ſhall take the *Dividend* into pieces, to ſhew the Four ſeveral Operations of the laſt Sum, and then give you ſome Examples for your Practice therein.

Dividend
Diviſor 4) 6788
Quotient 1697

4) 6 27 38 28
1 6 9 7

If you take 1 time 4 out of 6, there will remain 2 to the ſecond Figure 7, which makes it 27; then 4 in 27, there will be 6 times, and 3 will remain to the third Figure 8, which makes it 38; then 4 in 38, there will be 9 times, and 2 will remain to the fourth Figure, which is 8, and makes it 28; then 4 in 28 is 7 times, which place under 8, the laſt of your *Dividend*, and your *Quotient* will be 1697.

Examples for the Learners Practice.

(1)	(2)	(3)
5) 712640	6) 721494	7) 42165
142528	120249	6023$\frac{4}{7}$

VI. *If you cannot take the Diviſor out of the Dividend* as in the ſecond Example, then are you to put a Cypher in the Quotient, and reckon that Figure as ſo many Tens to the next, as before was ſhewed you in the laſt Rule.

Example.

6) 721494

120249

Say, 6 in 7 once, reſt 1, which makes the 2, 12; then 6 in 12, 2 times; then 6 in 1, 0 times, reſt 1, which makes the 4. 14; then 6 in 14, 2 times, reſt 2, which makes the 9, 29; then 6 in 29, 4 times, reſt 5, which makes the 4, 54; then 6 in 54, 9 times ſo the Quotient is 120249.

VII. *If after you have divided, there remains any thing*, that which remains is called a Fraction, and muſt be placed at ſome diſtance from the laſt Figure of the Quotient in a leſſer Character, then draw a ſmall Stroke under it, and place your Diviſor under, as in the Example following.

(4)	(5)	(6)
7) 54934	8) $3^{1}6495$	9) $3^{1}4^{2}565$
7847$\frac{5}{7}$	39561$\frac{7}{8}$	349173$\frac{8}{9}$

VIII. *To prove your Diviſion,* Multiply your Quotient by the Diviſor, to which add the Remainder; if the Product be the ſame as your Dividend is, your Work is true.

	8) 85436	7) 364153	9) 314254
	$10679\frac{4}{8}$	$52021\frac{6}{7}$	$34917\frac{1}{9}$
Proof	85436	364153	314254

To prove this laſt Example, where I divide by 9, I multiply 7 the Unit of my Quotient, by 9, the Diviſor, which makes 63, and the Remainder I added to it, makes 64; ſo I put 4, and carry 6, and ſay, 9 times 1 is 9, and 6 is 15, 5 and carry 1; then 9 times 9 is 81, and 1 I carry is 82, 2 and carry 8; then 9 times 4 is 36, and 8 is 44, 4 and carry 9; then 9 times 3 is 27, and 4 is 31, which put down, ſo the Product is 314254, the Sum equal with the Dividend, which was to be proved.

IX. *But if the firſt Figure of the Dividend towards the Left-hand, be leſſer than the firſt Figure of the Diviſor,* as is the Fifth and Sixth Examples of the Seventh Rule; then make the Two firſt Figures your Dividual, and proceed as before.

Other Examples of Diviſion by the foregoing Rules, without their Proofs.

	9) 51376	11) 413795	12) 413271
Quot.	$5708\frac{4}{9}$	$37617\frac{8}{11}$	$34439\frac{3}{12}$
Proof	51376	413795	413271

To divide by 11, ſay, 11 in 41, 3 times, reſt 8, which makes the 3, 83; then 11 in 83, 7 times, reſt 6, which makes the 7 67; then 11 in 67, 6 times, reſt 1, which makes the 9 19; then 11 in 19, 1 time reſt 8, which make the 5, 85; then 11 in 85, 7 times, the Remainder is $\frac{8}{11}$, ſo the *Quotient* is 37617 $\frac{8}{11}$.

And after this manner you may divide any Number by 12, 120, or 1200, as in the following Examples, the *Multiplication Table* being ſo compoſed, as to aſſiſt you in the multiplying and dividing by 11 and 12 as readily as by any other ſingle Figure.

X. To divide any Number by 10, 100, or 1000, as many Cyphers as you have in your *Diviſor*, cut off ſo many Figures from the Unit of your *Dividend*, as in the following Examples.

1|0) 4150|7 1|00) 3142|67 1|000) 91|437

Quot. 4150$\frac{7}{10}$ 3143$\frac{64}{100}$ 91$\frac{437}{1000}$

XI. *But if the Figure of the Diviſor be more than a Unit, and Cyphers follow it*, in ſuch Caſes, as many Cyphers as you have in the Units of your *Diviſor*, cut off ſo many Figures from the Unit of your *Dividend*, and proceed to divide as in ſingle Figures.

7|0) 5432|6 3|00) 84295|67

Quotient 776$\frac{6}{70}$ 28098$\frac{167}{300}$

Proof 54326 8429567

Various Examples for the Learners Practice.

	11|0) 372045|6	12|0) 412678|5
Quotient	$33822\frac{36}{110}$	$34389\frac{105}{120}$
Proof	3720456	4126785
	11|00) 621496 75	12|00) 814653 70
Quotient	$56499\frac{775}{1100}$	$67887\frac{970}{1100}$
Proof	62149675	81465370

Diviſion *by two or more Figures*, being the hardeſt Leſſon in Arithmetick, muſt be heedfully attended by the Learner, for whoſe eaſe I ſhall endeavour to make the way ſmooth, both by Rules and Examples.

XII. *When the Diviſor conſiſteth of more places than one*, then you are to ſet out ſo many Figures on the Left-hand of the *Dividend* for a *Dividual*, and then put a point under that Figure of the *Dividual* which ſtands next to the Right-Hand.

Then ſeek how often the Firſt Figure towards the Left hand of the *Diviſor*, is contained in the firſt Figure towards the Left hand of the ſaid *Dividual*, and place the *Anſwer* in the *Quotient*.

Then multiply the whole *Diviſor* by the ſaid Figure, ſo placed in the *Quotient*, and place the *Product* in order under the *Dividual*.

Which being done, ſubtract the ſaid *Product* from the *Dividual*, placing the *Remainder* below the Line.

Then put a Point under the next *Figure* of the *Dividend*, and annex it to the *Remainder*, ſo have you a new *Dividual*, with which you are to proceed as is before directed.

Example I.

Let it be required to divide 8904 by 42.

Here the given Number being diſpoſed of according to the Fourth Rule of this Chapter, will ſtand as followeth.

42) 8904 (

Then, becauſe there are 2 Places in the Diviſor, I take the two firſt Figures on the Left-hand of the Dividend for a Dividual, which is 89, putting a Point under the 9, which is that Figure of the Dividual which ſtands next to the Right-hand.

Then I ſeek how often the firſt Figure (4) of the Diviſor, is contained in the firſt Figure (8) of the Dividual, and the Anſwer is 2 times, wherefore I put 2 in the Quotient, and thereby I multiply the Diviſor 42, and the Product is 84, which I place in order under the Dividual 89, and ſubtract it therefrom, and the Remainder is 5.

Then I put a Point under the next place, which is (0), and annex to the ſaid Remainder 5, and it makes 50 for a new Dividual, and then the Work will ſtand as followeth.

42) 8904 (2
 . .
84
———
50

In the next place I ſeek how often I can have the firſt Figure of the Diviſor (which is 4) in the firſt Figure of the Dividual 50 (which is 5) and the Anſwer is 1 time, wherefore I put 1 in the Quotient, and hereby multiply the Diviſor 42, and the Product is 42, which I place in order under the Dividual 50, and ſubtract it therefrom, and the Remainder is 8, which I place in order under the Line, and thereto annex the next Figure of the Dividend, which is 4, (having firſt put a Point under it) and it makes 84 for a new Dividual, and then the Work will ſtand as followeth.

```
42)8904(212
   84
   ----
    50
    42
   ----
     84
     84
     --
      0
```

3. Then I again ſeek how often the firſt Figure of the Diviſor (which is 4) is contained in the firſt Figure of the Dividual (which is 8) and the Anſwer is 2 times, wherefore I put 2 in the Quotient, and thereby multiply the Diviſor 42, and the Product is 84 which I place orderly under the Dividual 84, and ſubtract it therefrom, and there remains 0. So is the Operation ended, and I find that 8904 being divided by 42, the Quotient is 212, as by the foregoing Operation appeareth.

XIII. *When you have multiplied the Diviſor by the Figure placed in the Quotient*, if the Product chance to be greater than the Dividual, then you may be ſure that the Figure placed in the *Quotient* is too much; wherefore in ſuch a Caſe you muſt cancel that Figure, and in the Room thereof put one that is leſs by an Unit, and if the Product be yet bigger than the Dividual, place yet a leſſer Figure than that in the Quotient, and then proceed as has been before directed.

Example

Example II.

Let it be required to divide 7868 by 37. The given Number being placed according to former Direction, I begin the Work, and firſt I ſeek how often I can have 3 (the Firſt Figure of the Diviſor) in 7 the Firſt Figure of the Dividual 78, (having before put a Point under the 8,) and the Anſwer is 2 times, wherefore I put 2 in the *Quotient*, and thereby multiply the Diviſor 37, and the Product is 74, which being ſubtracted from the Dividual 78, there remains 4, to which having annexed the next Figure of the Dividend (6) it makes 46 for a new Dividual. Then I proceed to ſeek how often 3 is contained in 4, and the Anſwer is 1 time, wherefore I put 1 in the Quotient, and thereby multiply the Diviſor 37, and the Product is 37, which being ſubtracted from the Dividual 46, the Remainder is 9, to which the next Figure of the Dividend being annexed, *viz.* 8, it makes 98 for a new Dividual. Then I proceed to ſeek how often I can have 3 in 9, and the Anſwer is 3 times, wherefore I put 3 in the Quotient, and thereby I multiply the Diviſor 37, and the Product is 111, which is more than the Dividual, whereby I perceive that I have put a Figure too big in the Quotient; therefore according to the Directions given in the foregoing Rule, I cancel the 3, and inſtead thereof I place a 2, and then multiply the Diviſor thereby, and the Product is 74, which is leſſer than the Dividual, wherefore I make Subtraction, and there remains 24; and ſo having never another Figure to bring down from the Dividend, I conclude the Work to be ended, and the Quotient thus found is 212, as by the following Operation appears.

2d. *Example,* 37) 7868 (212

74

46
37

98
$\cancel{1}\cancel{1}\cancel{1}$
74

Remainder (24)

And here Note: That if at any time it ſo happens, that after you have multiplied the Diviſor by the Figure laſt placed in the Quotient, and Subtracted the Product from the Dividual, if the Remainder be greater than the Diviſor, the Figure laſt placed in the Quotient is too little, and therefore it muſt be cancelled, and a bigger Figure placed in its room. What is to be done with the Remainder after Diviſion is ended, ſhall be ſhewed in its due place, but only for the preſent let it ſuffice to underſtand, that it is the Numerator of a Fraction, which is part of the Quotient, the Diviſor being the Denominator to the ſame. So the true Quotient of the laſt Diviſion is $212\frac{24}{37}$. But more of this hereafter.

XIV *When* (according to the Directions given in the laſt Rule) *you have aſſigned your Dividual to conſiſt of as many Places as the Diviſor containeth Places,* if then the Dividual be leſs than the Diviſor (ſo that the Diviſor cannot be ſubtracted therefrom) you are then to annex another Figure thereto, ſo that then it will conſiſt of one place more than the Diviſor hath Places, and then you are to ſeek how often the firſt Figure of your Diviſor is contained in the two firſt Figures of the Divi and then proceed according to the Rules before livered.

The like is to be obſerved in the middle of yo Work, if the Dividual chance to conſiſt of o Figure more than the Diviſor, as in the followi Example.

Example III.

Let it be required to divide 4763585 by 587.

Here, becauſe the Diviſor 587 conſiſteth of places, therefore I ſhould take the 3 firſt Figu to the Left hand of the Dividend for a Divid which is 476, but becauſe 476 is leſſer than t Diviſor 587, I therefore put another Figure the to, and then I have 4763 for a Dividual, and ha ing firſt put a Point under the Figure 3 I b gin the Diviſion, and firſt I ſeek how often (the firſt Figure) of the Diviſor, is contained 47 (the two firſt Figures of the Dividend) whi I find to be 9 times but having tryed accordi to the Thirteenth Rule of this Chapter, I find 9 too much, but it will bear 8, wherefore I put 8 the Quotient, and having multiplied the Diviſo thereby, and ſubtracted the Product from the Di dual, according to the Direction given in th Twelfth Rule of this Chapter, I find the Remainde to be 67, to which I annex the next Figure of th Dividend, which is 5, having firſt put a Point unde it (according to the ſaid Twelfth Rule) and then have 675 for a new Dividual. Then I ſeek ho oft 5 (the firſt of the Diviſor) is contained in (the firſt of the Dividend) and the Anſwer is which I put in the Quotient, and having multiplie and ſubtracted, I find the Remainder to be 88, t which annexing the next Figure in the Dividen it makes 888 for a new Dividual, then I ſeek, &c. and after Subtraction, there is a Remainder of 30 o which annexing the next and laſt Figure of the Dividend which is 5, it makes 3015 for a Dividual, which conſiſteth of one place more than the Diviſor, therefore according to the latter part of the Fourteenth Rule, I ſeek how often 5 is contained in o, and by tryal according to the Tenth Rule, I ind it will bear 5 times wherefore I put 5 in the Quotient, and having multiplied and ſubtracted, I ind the Remainder to be 80, and the Work is ended, nd I find the Quotient to be $8115\frac{80}{587}$. See the ollowing Work.

```
3d. Exam.   587)4763585
                4696
---------       ----
Quot. 8115       675
                 587
---------        ---
                 888
                 587
                 ---
                 3015
                 2935
                 ----
                 c80 Remainder.

Exam.  Divide 72164375 by 9437.
         9437) 66059···  (7646 Quot.
              ------
              61053
               6622
              ------
               44317
               37748
              ------
               65695
               56622
               -----
   Remainder 9073
```

Thus have I run through one ſort of Diviſion and I hope that by this time the Learner is able divide any Number given; and here let him tak notice once for all, that there muſt never be brough down but one Figure or Cypher at one time from th Dividend, to be annexed to the Remainder for a new Dividual, and for every ſuch Figure or Cypher brought down, there muſt be a Figure or Cypher in the Quotient.

I might give you many more Examples of *Diviſion*, wherein the Diviſor may conſiſt of 4 5 6, 8, 9, 10, *&c.* places, but the Method being the ver ſame with what is before delivered, I ſhall therefore forbear, and only admoniſh the Learner to be perfect in the foregoing Rules, and to practice wel the Examples therein delivered; and for further Practice, I ſhall give you the Quotients of Four othe Examples, but ſhall omit the Operation as a Whetſtone for the Learners Ingenuity.

If you divide 2459337266 by 384, the Quotien will be 63942, and the Remainder after the Work finiſhed 562.

And if you divide 49267345806877 by 584679 the Quotient will be 842639, and there will be Remainder of 150.

Or if you divide 107925884216 by 1998573 the Quotient will be 540008, and there will be a Remainder of 475632.

Alſo if you divide 2395095414141498 by 29786 the Quotient will be 8040905964, and there will be a Remainder of 80602.

There is yet a much ſhorter (way of) Diviſion, by omitting to ſet down the Multiplication of you Diviſor, (as is done in the foregoing Examples) and in this you Multiply and Subtract together: In which way the Quotient is placed under the Diviſor, as being moſt ready and convenient for the working of any Sum. And being the moſt accurat

an

nd ready way of Diviſion, I ſhall purſue this Me-
od through the remaining part of this Book, after
have given three or four Examples of one, and the
me Sum divided by both ways for the Learners
ſe and Practice.

Let us divide the two laſt foregoing Sums by this
ort *Italian* way of Diviſion, *viz.* the third and
uth Examples.

Firſt of all, Let it be required to divide 4763585
y 587, being the third Example.

Firſt, I proceed and aſk the Queſtion, as was
ewed you in the third Example of this Rule, and
y, how often 5, the firſt Figure of the Diviſor,
n I have in 47, the firſt Figures of the Dividend?
nſwer, 8 times. Then multiply 7, the Unit Fi-
re of your Diviſor, by 8, the Figure which you
ing in your Quotient, and ſay, 8 times 7 is 56
t of 3 (the fourth Figure of the Dividend) I
nnot, but 56 out of 63, reſt 7, and carry 6 to
e ſecond Figure of the Diviſor. Then multiply
ain, and ſay, 8 times 8 is 64, and 6 I carried is
o, out of 6 I cannot, but 70 out of 76, reſt 6,
d carry 7 to the firſt Figure of the Diviſor; then
ultiply again, and ſay, 8 times 5 is 40 and 7 I
rried is 47 out of 47, reſt 0. So that by this Ope-
tion you find after 8 times 587 is taken out of
763, there will remain 67, to which I take down
the next Figure of my Dividend, for a new Di-
idend.

```
587) 4763585
-----
8      675
```

Then I proceed again, and ſay, how often
87 (my Diviſor) can I have in 675, my Divi-
end? The Anſwer is once, which I put in the
uotient, and multiply as before, and ſay once

7 out of 5 I cannot, but 7 out of 15, reſt 8, and carry 1; then once 8 is 8, and 1 is 9, 9 out of 7 I cannot, but 9 out of 17, reſt 8, and carry 1: then once 5 is 5, and 1 I carry is 6, 6 out of 6, there reſts (0) which I omit to place down, becauſe a (0) on the Left hand is inſignificant: Then to the Remainder 88 I take down 8, the next Figure of my Dividend, and it makes my new Dividend 888.

587) 4763585
81 675
888

Then I proceed again, and ask, How often 587, my Diviſor, can I take out of 888, my Dividend? the Anſwer is once, which 1 I put in the Quotient, and ſay, once 7 out of 8, reſt 1; then once 8 is 8, out of 8, reſt 0; then once 5 out of 8, reſt 3; ſo the Remainder of that Diviſion is 301, to which I take down 5, the next Figure of my Dividend, which makes my new Dividend 3015.

587) 4763585
81 675
888
3015

Then I proceed and ask again, how often 587 I can have in my laſt Dividend 3015? the Anſwer is 5 times, which 5 I place in my Quotient, and multiply as before, and ſay, 5 times 7 is 35, out of 5 I cannot, but 35 out of 35, reſt 0, and carry 3; then again, 5 times 8 is 40, and 3 I carry is 43, out of 1 I cannot, but 43 out of 51, reſt 8, and carry 5; then laſtly, 5 times 5 is 25, and 5 I

carry

rry is 30, 30 out of 30 reſt 0. So my Remainder of is laſt Diviſion is 80, which I cut off with a ſtroke om the reſt of the Work to ſignifie it to be a Remainder, and my whole Operation of the Sum ſtands followeth.

Example I.

```
                      Dividend.
   Divisor  587)  4763585
            ----
Quotient  8115        675
                      888
                     3015
                     ----
                      80 Remainder.
```

Example II.

```
          9437) Divide 72164375 by 9437
          ----
uotient   7646            61053
          ----             44317
          56622             65695
         37748            -------
        56622                9073
       66059
       -------
       71155302
           9073
  ----
      72164375
```

72164375 Proof, is to multiply the Quo- nt by the Divisor, and to the Product add the mainder.

Examples of the ſhort* Italian *way of Diviſion for th
Learners Practice, with their Proofs.

297546) 1489751828835.
....

Quotient 5006765 02021828
297546 2365528
2827063
1491495
3765

30040770
20027180
25033975
35047565
45061155
10013598

1489751825070
3765 Remainder.

1489751828835 Proof.

The ſame Examples after the long* Italian *way of
Diviſion, with their Proof.

297546) 1489751828135 (5006795
1487730......

2021828
1785276

2365528
2082822

2827063
2677914

1491495
1487730

Remainder 3765

To prove your Diviſion.

1. Multiply your Quotient by your Diviſor (and to the Product add your Remainder, if any be) the Sum of all added together, will be equal to your Dividend if your Work be true. Or,

2. You may take the ſeveral Products that are placed under each *Dividual* (in this way of Diviſion,) and place them in the ſame Order as they there ſtand in reſpect to one another, and to their Sum add the Remainder, and the *proof* will ſtand as followeth.

```
1487730
 1785276
  2082822
   2677914
    1487730
        3765 Remainder.
―――――――――――――
14897518288835 Proof.
```

Or, You may alſo prove Diviſion by caſting out the Nines; thus,

Firſt, Make a Croſs, then caſt the Nines out of your Diviſor, and place the Remainder on the left ſide of the Croſs. Then caſt the Nines out of your Quotient, and place the Remainder oppoſite to the other, on the right ſide of the Croſs. Multiply theſe two Figures together, and out of your Product caſt the Nines, the Overplus carry to the Remainder, and continue to caſt out all the Nines therefrom, and the Remainder above Nine place on the top of the Croſs.

Laſtly, Caſt the Nines out of your Dividend, and if that Remainder comes to be the ſame Figure with that placed on the top, your Sum is true; then place that laſt Figure at the bottom of your Croſs.

But the moſt certain Proof of *Diviſion* (as I ſhewed before) is by *Multiplication*, and the moſt certain Proof of *Multiplication* is by *Diviſion*, they interchangeably proving each other.

For if you divide the *Product* by the *Multiplicand*, the *Quotient* will be equal to the *Multiplier*.

If you divide the *Product* by the *Multiplier*, the *Quotient* will be equal to the *Multiplicand*.

An Example or two will make this Proof of *Diviſion* plain.

	(1) Dividend.		(2)
Diviſor 754)	912673	457)	159137
	1586		2203
Quotient 1210	787	348	3757
	333		101

In the firſt of theſe Two laſt Examples my Diviſor is 754, Quotient is 1210, Remainder is 333, and Dividend 912673. *To prove which*, make a Croſs, as in the Margent: Then caſt the Nines out of the Diviſor, there will remain 7, which I place on the Left-ſide of the Croſs, then caſt the Nines out of the Quotient, reſt 4, Multiply 7 by 4, it makes 28, caſt out the Nines, reſt 1, which I carry to the Remainder, and ſay 1 and 3 is 4, and 3 is 7, and 3 is 10, caſt out 9, reſt 1, which I place above the Croſs.

1
7 + 4
1

Laſtly, Caſt the Nines out of your Dividend, and there will reſt 1, which place under the Croſs, and your Sum is true.

XV. When the Diviſor conſiſteth of any other Number with a Cypher or Cyphers annexed thereto, then cut off the Cyphers of the *Diviſor* with a daſh of the Pen, and as many Cyphers as you cut off from the *Diviſor*, ſo many places muſt you cut off from the *Dividend*; then proceed to divide the remaining Figures of the *Diviſor*, as if there were no ſuch Cyphers or Figures in the *Diviſor* or *Dividend* as you cut off and if nothing remain after *Diviſion* is ended, then ſhall the Figures you cut off from the given *Dividend* be the true Remainder; but if any thing do remain after *Diviſion* is ended, you are there to annex the Figures of the *Dividend* that were before cut off, ſo ſhall the ſaid Remainder, with the Figures annexed thereto, be the true Remainder.

Example.

Divide 486793 by 15000. Firſt, I cut off the three Cyphers of the *Diviſor*, and alſo three places of the Right Hand of the *Dividend*, ſo have I 15 for my *Diviſor*, and 486 for my *Dividend*, *viz.*

15|000) 486| 793 (32
45
———
36
30
———
6

The ſame ſhort way of Diviſion.

15|000) 486|793
——— 36
32 6

Here I find the *Quotient* to be 32, and the Remainder is 6, to which annexing the Figures cut off from the *Dividend*, *viz.* 793, it makes 6793 for the true Remainder.

Having thus enlarged and finiſhed the firſt Fundamental Rules of *Arithmetick*, their Application ſhall be more particularly Taught, in the following Chapters.

CHAP. VI.

Of REDUCTION.

I. REDUCTION *Teacheth to reduce Numbers, whether Money, Weight, Meaſure, Time, Motion,* &c. *from one Denomination to another, diſcovering the ſame Value, but in different Terms.*

II. The whole Work of *Reduction* is performed by Multiplication and Diviſion.

III. All great Denominations are brought into leſſer of the ſame Value by Multiplication, and this is by ſome called *REDUCTION DESCENDING.*

IV. All ſmall Denominations are brought into greater of the ſame Value by Reduction, and this is by ſome called *REDUCTION ASCENDING.*

V. *To reduce greater Denominations into leſſer of the ſame Value,* Conſider how many of the *Leſſer* are equal to one of the *Greater*, and multiply the given Number thereby, ſo ſhall the Product be the Anſwer to the Queſtion.

Example.

Reduce 3468 *Shillings into Pence.*

```
    3468
      12
 --------
fac 41616 Pence.
```

Here I conſider that 12 *pence* is a *ſhilling*, and the *pence* ought to be 12 times the Number of *ſhillings*, wherefore I multiply by 12 at one Operation, according to th the Fourteenth Rule of the Fourth Chapter, and the Product is 41616 *pence*, as in the Margin.

VI. *To reduce Smaller Denominations into Greater*, Conſider how many of the *Smaller* are equal to one of the *Greater*, and divide thereby ; the Quotient is the Anſwer to the Queſtion.

Example.

Reduce 41616 *Pence into Shillings.*

12) 41616
———
fac. 3468 Shill.

Firſt, Conſider that 12 *pence* is a *ſhilling*, and that the *ſhillings* ought to be a twelfth part of the *pence* ; wherefore I divide the given Number by 12 at one Operation, as was ſhewed you in the Eleventh Rule of the Fifth Chapter, and ſay, 12 in 41 3 times, reſt 5 to the 6 makes it 56, then 56, 4 times, reſt 8, which makes the 1 81 ; then 12 in 81, 6 times, reſt 9, which makes the 6 96 ; then 12 in 96, is 8 times, and the Quotient gives me 3468 *ſhillings*, which is the Anſwer to the Queſtion, and may ſerve for a Proof of the foregoing Example.

Note, I would adviſe the Learner to inure himſelf to the moſt ſhort and ready ways of Multiplication and Diviſion, which will very much contract the Operations in *Reduction*, *viz.* In Reduction of Money, to multiply the *Shillings* by 12 at one Operation as in *Chap.* 4. of *Multiplication*, Rule 14. And likewiſe to divide by 12 at one Operation, as in the 9th and 11th Rules of the Fifth Chapter.

For your further Aſſiſtance in *Reduction*, you ought to have reſpect to the Tables of *Coin*, *Weight*, *Meaſure*, &c. delivered in the Second Chapter.

Example I.

In 685 l. I demand how many Shillings, Pence, and Farthings?

685 *Pounds.*
20

13700 *Shil.*
12

164400 *Pence.*
4

fa. 657600 *Farth.*

Firſt, I multiply by 20 (becauſe 20 *Shillings* is a *Pound*) and the Product is 13700 *Shillings*, then I multiply the *Shillings* by 12, (becauſe 12 *Pence* is a *Shilling*) and the Product is 164400 *Pence*; then I multiply the *Farthings* by 4, (becauſe 4 *Farthings* is a *Penny*,) and the Product is 657600 *Farthings*; as in the Margent.

This or any other Number of *Pounds* might be reduced into *Pence* or *Farthings* at one Operation, without reducing it into the intermediate Denominations.

For if you multiply *Pounds* by 240 (becauſe ſo many *Pence make a Pound*) the Product will be *Pence*; and if you multiply *Pounds* by 960 (becauſe 960 *Farthings* is a *Pound*) the Product will be *Farthings*: So in the foregoing Example 685 *l.* being multiplied by 240, the Product you will find to be 164400 *Pence*, and if you multiply 685 *l.* by 960, the Product will be 657600 *Farthings*, for the Reaſons before ſaid.

20 *Shill.*
12

240 *Pence*
4

960 *Farth.*
one Pound.

But you may ſay, you cannot well remember how many *Pence* or *Farthings* make a *Pound* I will therefore teach you how to find it out at any time when you have Occaſion. You may eaſily remember that 20 *Shillings* is a *Pound*, and that multiplied by 12, produceth 240 *Pence*, which being multiplied by 4, produceth 960 *Farthings*, as in the Margent.

Example 2.

In 657600 *Farthings, I demand how many Pence, Shillings and Pounds?*

This Queſtion is the Reverſe of the former, and may ſerve for a Proof thereof : Firſt, I divide the *Farthings* by 4, and the *Quotient* is 164400 *Pence*, then I divide the *Pence* by 12, and the *Quotient* is 13700 *Shillings*, and the *Shillings* I divide by 20, and the *Quotient* is 685 *Pounds* ; which is equal to the given Number in the firſt Example. See the whole Operation as followeth :

4) 657600 *Farthings.*

12) 164400 *Pence.*

2|0) 1370|0 *Shillings.*

Facit 685 *Pounds.*

VII. *When in Reduction Deſcending*, the Number propounded to be reduced conſiſteth of divers Denominations, as of *Pounds*, *Shillings*, *Pence* and *Farthings*, or of *Pounds*, *Ounces*, *Penny-Weights* and *Grains*, &c. then you may readily reduce it into the loweſt Denomination : Thus when you reduce an higher Denomination into the next inferiour, add to the Product the expreſſed Parts into which you reduce it, as if you were to reduce *Pounds* into *Shillings*, add to the Product (as you multiply) the *Shilling* that are expreſſed in the Number propounded ; proceed in the ſame Method till you have reduced the given Number into the Denomination required, as in the following Example.

Example III.

Reduce 567 *l.* 15 *s.* 6 *d.* $\frac{3}{4}$. *into Farthings.*

Firſt, I multiply by 20 to bring into *Shillings*, ſaying, 0 times 7 is 0, but 5 is 5, (taking in the 5 that is in the place of Units in the *Rank of Shillings*, and ſetting it in the place of Units in the Product;) then 2 times 7 is 14, and 1 is 15, (taking in the 1 that is in the place of Tens in the *Rank of Shillings*) ſo I ſet down 5 in the place of Tens in the Product, *&c.* the Product is 11355 *Shillings*; then I multiply the *ſhillings* by 12 to bring them into *pence*, ſaying, 12 times 5 is 60, and 6 is 66, (taking in the 6 that ſtands in the *Rank of pence*,) *&c.* and the *pence*, make 136266; then I multiply my *pence* by 4, to bring them into *Farthings*, ſaying, 4 times 6 is 24, and 3 is 27, taking in the 3 which ſtands in the *Rank of Farthings*, *&c.* ſo the *Farthings* amount to 545067, as by the whole Operation appeareth, *viz.*

567 *l.*—15 *s.*—6 *d.* $\frac{3}{4}$.
20

11355 *Shillings.*
12

136266 *Pence.*
4

545067 *Farthings.*

Obſerve the like in any other Example.

VIII. *When in Reduction Aſcending* any thing remains after Diviſion is ended, it is always of the ſame Denomination with the Dividend, as in the following Example.

Example IV.

In 545067 *Farthings, I demand how many Pounds?*

Firſt, I divide the given Number of *Farthings* by 4, and the *Quotient* is 136266 *pence*, and there remains 3, which is 3 *Farthings*, becauſe the Dividend was *Farthings*.

Then I divide the *pence* by 12, and the *Quotient* is 11355 *Shillings*, and there remains 6, which is 6 *pence*, becauſe the Dividend was *pence*.

Then I divide the *Shillings* by 20, and the *Quotient* is 567 *l.* and there remaineth 5, which is *Shillings*. becauſe the Dividend was *Shillings*: So that I find by the Work, 545067 *Farthings* to be 567 *l.* 15 *s.* 6 *d.* $\frac{3}{4}$; as by the following Work.

4) 545067

12) 136266 $\frac{3}{4}$

2|0) 11355 : 6 *d.*

Fa. ℔. 567 15 *s.* 6 *d.* $\frac{3}{4}$

This Queſtion is the Inverſe of the *Third Example*, and may very well ſerve for a Proof thereof, as you may obſerve at your Leiſure.

Here by the way take Notice, That when you are (to *divide* any Number by 20, that is) to bring *ſhillings* into *pounds*, the beſt way is to cut off a Figure to the right hand for *Shillings*, and then to take half the Figures to the left hand for *pounds*, and if 1 remain, it is 10 *ſhillings* to be added to the Figure firſt cut off. For *Example*:

Where 11355 *Shillings is to be reduced into Pounds* I cut off the laſt Figure 5 for Shillings, and ſay Half of 11 is 5, Half of 13 is 6, Half of 15 is 7, and there remains 1, which make the 5 Shillings to be 15 Shillings; and this Method ſhall be obſerved hereafter.

1134 *l.* 5 *s.* *d.*

Fac. 567 - 15 - 0

Note, Once for all, That Reduction *Aſcending* proves Reduction *Deſcending*, the one being a Reverſe to the other, as ſhall be demonſtrated in the enſuing Queſtions that follow in all the Varieties of Reduction.

In 7642 *l.* 17 *s.* 11 *d.* $\frac{1}{8}$, *I demand how many* (*half Farthings.*

20

152857 *Shillings.*

12

1834295

8

Fa. 14674360 *half Farthings.*

Tun. C. *qr.* ℔.

Queſt. 1. *In* 95 : 11 : 3 : 15 *how many Pound* (*Weight?*

Averdupois Weight.

20

1911 *hundred.*

44

7647 *quarters.*

28

61181

15295

Facit. 214131

Queſt.

C. *qr.* ℔. *oz.*

Queſt. 2. *In* 50 : 2 : 15 : 9 *how many Ounces?*

4

202

28

1621

405

5671

16

34035

5671

Facit 90745 *Ounces.*

By this you ſee that if 50 C. 2 *qr.* 15 ℔ 9. *oz.* be *multiplied* according to the Directions given in the 7th Rule of this Chapter, the Product will be 90745 Ounces, which is the Reverſe or Proof of the ſecond Queſtion oppoſite to this on the Right-hand.

Queſt. 1. *In* 214131 *Pound Weight how many Tun?*

28) 181

133

4) 7647 211

2|0) 191 $\frac{3}{4}$ 15 *Pound.*

Proof, 95 : 11 : 3 15. By this you ſee that if 214131 Pound Weight be *Divided* by 28, by 4, and 20, it will produce 25 *Tun.* 11 C. 3 *qrs.* 15 ℔ which is the Reverſe of the firſt Queſtion on the Left-hand.

Queſt. 2. *In* 90745 *Ounces how many Hundred* (*Weight?*

16) 107
114
28) 5671 25
71
4) 242 9
15 *Ounces*
50 : 2 : 15 : 9 Proof.

℥. *pw. gr.*

Queſt. 3. *In* 50 : 10 : 11 *how many Grains of* (*Silver?*

Troy Weight

20
1010
24
4041
2021

Facit 24251 *Grains of Silver.*

Queſt. 4. *In* 507—10—11 *how many Grains of* (*Silver?*

Troy Weight

20
10150 *penny weight.*
24
40601
20301

Facit 243611 *Grains*

Tuns.

Tun. hh. gall.
Queſt. 5. *In* 54—2—25 *how many Quarts of Wine?*
Liquid Meaſure
4
———
218 *hhead.*
63
———
659
1310
———
13759 *gallons.*
[illegible]
———
Proof 55036 *quarts.*

Laſt. qr. buſh. gall.
Queſt. 6. *In* 75—5—3—2 *how many Gallons of Wheat?*
Dry Meaſure
10
———
755 *quarters.*
8
———
6043 *buſhels.*
———
Facit 48346 *gallons.*

Queſt. 7. *In* 243611 *Grains, how many Ounces of Silver?*
24) 36
121
———
2|0) 1015|0
11
———
Proof 507 : 10 : *p. w.* 11 *Grains.*

Queſt. 4. *In* 55036 *Quarts, how many Tuns of* (*Wine* ?
4) ——
63) 13739
—— 115
4) 218   529
54   25 *Gall.*
Facit. 54 2 *hh* 25 *Gall.*

Queſt. 5. *In* 48346 *Gallons, how many Laſts of* (*Wheat?*
8)
8) 6043 : 2
1 0) 75|5 : 3
Proof 75 : 5 : 3 : 2

By the foregoing Examples, the Learner may be ſufficiently inſtructed in the working and proving any Sum in *Reduction.* I ſhall forbear to give you any more Examples of this Nature, my Deſign being to improve the remaining Paper with Matter more uſeful, after I have given three or four more Examples in *Cloth Meaſure*, and *Reduction of Time.*

Cloth Meaſure.

Queſt. 6. *In* 207 *Ells,* 2 *Quarters,* 2 *Nails, how* (*many Nails?*
5
1037 *quarters.*
4
Fa. 4150 *Nails.*

Queſt. 7. *In* 107 *Yards,* 3 *Quarters,* 1 *Nail, how many Nails?*
4

431 *Quarters.*
4

Fa. 1725 *Nails.*

Queſt. 8. *In* 312 *Ells* Flemiſh, 2 *Quart. how many Quarters?*
3

938 *Quarters.*

Queſt. 9. *In* 112 *Aulns,* 1 *Quart.* 2 *Nails, how many Nails?*
6

673 *Quarters.*
4

Fa. 2694 *Nails.*

Long

Long *Meaſure.*

Queſt. 10. *The Circumference of the Earth being* 360 *Degrees, and every Degree* 60 Engliſh *Miles, I demand how many Miles, Furlongs, Perches, Inches, and Barley-Corns will reach round the World?*

360 *Degrees.*
60 *Miles a Degree.*

21600 *Miles about the Earth.*
8

172800 *Furlongs about the Earth.*
40 *Perches in a Mile.*

6912000 *Perches about the Earth.*
33 *Half Feet in a Perch.*

20736000
20736000

228096000 *Half Feet about the Earth.*
6 *Inches in a half Foot.*

1368576000 *Inches.*
3 *Barley-Corns in an Inch.*

4105728000 *Barley-Corns about the Earth.*

Queſt. 11. *I demand how many Days, Hours, and Minutes it is ſince the Birth of our* Saviour Jeſus Chriſt, *to this preſent Year,* 1718.

1718 *Years.*
365 *Days in one Year.*

8590
10308
5154

627070 *Days ſince the Birth of Chriſt.*
24 *Hours in one Day.*

2508280   1718
1254140   6

15049680   10308 *Hours to be added.*
10308 *hours added.*

15059988 *Hours ſince the Birth of Chriſt.*
60 *Minutes in one Hour.*

903599280 *Minutes ſince the Birth of Chriſt.*

Note, That 6 Hours is loſt in every Year; to correct which, you multiply the Number of Years to be reduced by 6, and the product will give you the Hours to be added to the given Time, as you may ſee in the Example above.

REDUCTION (according to the firſt Rule of this Chapter) teacheth you alſo to reduce the *Coins*, *Weights*, and *Meaſures* of one Country into the *Coins*, *Weights*, and *Meaſures* of any other Country. As for Example:

Queſt. 1. *I have bought* 3507 *Ells* Flemiſh *of Genting Cloth, I would know how many Ells* Engliſh *is contained therein?*

The moſt Practical way to work this, is to multiply the Ells *Flemiſh* by 6, and divide by 10, which contracts the Work, becauſe to divide by 10, is only to cut off the laſt Figure of the Dividend. And the Reaſon is this, there is 6 half quarters of a Yard in an Ell *Flemiſh* : And there is 10 half quarters of a Yard in an Ell *Engliſh* : The Work ſtands, *viz.*

3507 *Ells Engl*
6 *Fac.* 2104 $\frac{2}{10}$, *which is equ*
to $\frac{1}{5}$ *the Quarter of an El*
2104|2 Engliſh.

Queſt. 2. *In* 4215 $\frac{1}{2}$ *Ells* Flemiſh *how many Ell*
6 (Engliſh
Ells Engliſh.
2529|3 *fa.* 2529 *and* $\frac{3}{10}$, *or three hal*
quarters.

Queſt. 3. *In* 295 *Ells* Engliſh *how many* Portugal
20 (*Veres of* 15 *Nails*
15) 5900
140
393 50
Veres.
5 *fac.* 393 $\frac{5}{15}$

s. d.
Queſt. 4. *In* 205 *Piſtoles, at* 17 : 6 *how many Poun*
210 12 (*Sterling?*
2050 210
410
24|0) 4305|0 *Pence in all the Piſtoles.*
90
179 225
9 *fac.* 179 *l.* and 90 *Pence.*

Queſt. 5. *In an Ingot of Silver, Quantity* 24 ℔. 7 *oz.* *How many Salvers, Quantity* 12 *oz.* $\frac{1}{2}$?

℔. *oz.*
24 7
12 12 $\frac{1}{2}$

295 25
2

25) 590 *half Ounces.*
90
23

15 *fac.* 23 *Salvers, and* 15 *half Ounces*

Queſt. 6. *In* 142 C. 3 *qr.* 19 ℔. *of Sugar, How many Boxes of* 84 ℔.?
4

571
28

4577
1143

84) 16007 *Pound Weight.*
706
190

Boxes. ℔.
47 *fac.* 190 *and* 47 *of Sugar.*

Queſt 7. *In* 35 l. 11 s. 4 d. *how many Dollars* (4 s. 6

```
          35 l.  11 s.  4 d.              (4 s. 6
          20                               12.
         ----                              --
          711                              24
           12
       -------
   54)   8536
    --    313
   158    436
  -----  -----
           4
```

Fac. 158 *Dollars and* 4 *Pence.*

Queſt.8. *In* 75 *Hogſheads of Wine, how many Rundle* (*of* 22 *Gallon*

```
          75
          63
      -------
         225
        450
     --------
   22) 4725
   --    32
  214   105
       -----
         17
```

Rundl.

Fac. 214 *and* 17 *Gallons.*

Queſt. 9. *In* 905 *Guineas, at* 21 s. 10 d. ⅝ *how man Piſtoles, at* 17 s. 6 d.

```
                       s.    d.               s.   d.
         905-------21  :  10 5/8  ---------   17 : 6
        2101           12                     12
        ----          ----                   ----
         905           262                    210
        9050             8                      8
       1810           ----                   ----
   -----------        2101                   1680
   168|0  190140|5
   -----    221
   1131     534
             300
   -----  -----
```

Piſtoles.

1325. *Fac.* 1131. *and* 1325 *half Farth.*

Queſt

ueſt. 10. *Bought at* Bourdeaux 10 *Pieces of Pruens, quantity* 95 *Quintals, I demand how many* C. *Weight it makes in* London ?

```
      95        Note, 100 ℔. is a Quintal.
     100
     ———
112) 9500
———   540
 84  ———      C.  ℔.
      92 Fac. 84—92 in London.
```

ueſt. 11. *A Merchant at* London *receives an Invoyce from his Correſpondent at* Jamaica *of ſeveral Hogſheads of Sugar*, *Quantity* 195 C. 1 qr. 16 ℔. *at* Jamaica, *I demand what Weight they produce at* London ?

```
       C.   qr.  ℔.
      195 — 1 — 16
            4
      ———
      781
       25
      ———
     3911
     1563
     ————
112) 19541
 —     834
 174   501
     ————
       53 Fac. 174—53 in London.
```

CHAP.

CHAP. VII.

The Golden Rule; or, *Rule of Three Direct.*

I. THE *Rule of Three* is ſo called, becauſe i it there are always *Three Numbers* given t find out a *Fourth*. It is alſo called the *Golden Rul,* for its excellent Performances in the Art of Numbers.

II. The Rule of Three is either *Single* or *Compound.*

III. The *Single* Rule of Three is either *Direct*, o *Inverſe.*

IV. The *Single Rule of Three Direct*, is when there are *Three Numbers* given to find out a *Fourth* in a direct Proportion; that is, when the *Fourth* Numbe ought to bear ſuch Proportion to the *Third* as the *Second* doth to the *Firſt*; Or, as the *Firſt* is in proportion to the *Second*, ſo is the *Third* to the *Fourth.* This is called a *Direct Proportion.*

V. *In the ſingle Rule of Three*, the two firſt of the given Numbers imply a Suppoſition, and the third a Demand.

VI. The *Three given Numbers* muſt be ranked i ſuch Order, as that the Number to which the Demand is affixed, may poſſeſs the *Third* place, and that Number in the Suppoſition, that is of the ſame Name, Kind, or Quality with that in the *Third* place, muſt poſſeſs the *Firſt* place, and the other Number in the Suppoſition muſt poſſeſs the *Second* place, and is evermore of the ſame Name, Kind, or Quality with the Number ſought.

Example. ***If 18 Yards of Camblet coſt 72 s. what will 596 Yards coſt at that Rate?***

In this Example the Suppoſition is this, *viz.* If 8 Yards coſt 72 Shillings. And in the other Number (596) is implied a Demand, *viz.* What ill 596 Yards coſt? Therefore muſt 596 Yards be he third Number and that Number in the Suppo-ition which is of the ſame kind with 596 muſt be he firſt Number, which here is 18, becauſe that ſig-ifieth Yards as well as the third Number; and the ther Number in the Suppoſition, which here is 72, s the ſecond Number, and is of the ſame kind ith the fourth Number, or Number ſought; for he Number ſought by the Queſtion is the Price of 96 Yards, and the ſecond Number is the Price of he *firſt, viz.* 72 Shillings. Now the given Number eing duly ſtated and ranked according to the fore-oing Directions, will ſtand thus,

yrds. *s.* *yrds.*
18——72——596

VII. *In the Single Rule of Three Direct, if you Mul-iply the Second Number by the third, or (which is all ne) the third Number by the ſecond, and divide the Pro-uct thereof by the firſt, the Quotient thence ariſing is he fourth Proportional Number ſought, or Anſwer to e Queſtion.* As in the foregoing Example, *viz.* If 8 Yards of Camblet coſt 72 Shillings, what will 96 Yards coſt at that rate? The Numbers given in e Queſtion being ranked according to the Directi-ns given in the ſixth Rule, multiply the ſecond umber (72) by (596) the third Number, and the roduct is 42912, which being divided by (18) the rſt Number, the Quotient is 2384, which is the ourth Number, or Anſwer to the Queſtion. See e whole Operation as followeth, *viz.*

yrds. *s.* *yrds.*
18 give —— 72 —— —what will 596
72
——
1192
4172
——
18) 42912 ſhill.
—— 69
fa. 3484 151
ſhill. 72
——
0

VIII. When (according to the foregoing Directions) you have found out the *Anſwer* to the *Queſtion*, you are always to eſteem it of the ſame Name that your *ſecond* Number was of, or reduced to. So here in the foregoing Example, the *Anſwer* to the *Queſtion* is 2384 *Shillings*, becauſe the *ſecond* Number is 72 *Shillings*. And if the *ſecond* Number had been reduced into *Pence*, it makes 864, and then the *Anſwer* would have been 28608 *Pence*, as by the following Operation appears.

yrds. *s.* *yrds.*
18 give —— 72 —— what will 596
12 864
—— ——
86 2384
3576
4768
——
18) 514944
—— 154
fa. 28608 109
144
——
0

Fac. 28608 Pence, equal to 2384 Shillings.

Likewiſe if the *ſecond* Number had been reduced into *Farthings*, it would have been 3456, which being multiplied by (596) the *third* Number, the Product is 2059776, which being divided by (18) the *firſt* Number, the Quotient is 114432 *Farthings*, equal to 119 *l.* 4 *s.* as before; which you may prove at your Leiſure.

IX. When the *ſecond* Number conſiſteth of divers Denominations; as, of *pounds* and *ſhillings*, or of *pounds*, *ſhillings* and *pence*, then you muſt reduce it to the loweſt Name mentioned, or lower if you pleaſe, and then multiply the *ſecond* by the *third*, and divide the Product by the *firſt*, *&c.* as before directed.

Example II.

If 26 *Yards of Broad-Cloth coſt* 12 l. 02 s. 08 d. *what will* 248 *Yards of the ſame coſt at that Rate?*

The given Numbers in the Example being ranked according to the Directions given in the Sixth Rule aforegoing, will ſtand thus:

yds.	*l.*	*s.*	*d.*	*yds.*
26	12	02	08	248

Here the *ſecond* Number conſiſteth of divers Denominations, *viz. pounds*, *ſhillings* and *pence*; therefore muſt it be reduced to the loweſt Name mentioned, which is *pence*, and it makes 2912, which being multiplied by (248) the *third* Number, the Product is 722176, which being divided by (26) the *firſt* Number, the Quotient is 27776 *pence*, becauſe the *ſecond* Number was reduced into *pence*, which is the Anſwer to the Queſtion, and may be reduced to 115 *l.* 14 *s.* 08 *d.* As you may ſee by the following Operation.

```
yrds.              l.    s.    d.              yrds.
20 ———— give 12 —— 02 —— 08 ———— what 248
             20
            ———
            242 Shillings.
             12
           ————
           2912
            248
          —————
          23296
         11648
         5824
         ——————
    26)  722167
    —    202
12) 2776 d. 201
    ————    197
2,0)231|4 : 8 156
    ————————  ———
    115 : 14 : 8  0

     l.   s.   d.
 ſa. 115 : 14 : 8
```

X. If the *firſt* and *third* Numbers, or either of them, conſiſt of divers Denominations, then muſt they be both reduced to the loweſt Denomination mentioned in either of them, as if the *firſt* Number be Hundred Weights only, and the *third* be Hundreds, Quarters, and Pounds, then muſt they be both reduced into Pounds, becauſe Pounds are mentioned in the *third* Number. Or if the *firſt* and *third* Numbers being of one kind, are notwithſtanding of different Denominations; then muſt they be reduced to one Denomination, s if the *firſt* be Pounds of Weight, and the *third* e Hundred Weights, then muſt the *third* Number e reduced to Pounds as is the *firſt*.

Example III.

If 1 C. *Weight of Tobacco coſt* 4 l. 5 s. 2 d. *what will* 34 C. 3 qrs. 18 ℔. *coſt at that Rate?*

In this Example, becauſe the *third* Number has *ounds* mentioned therein, therefore muſt the *firſt* nd *third* Numbers be both reduced to *pounds*, and he *ſecond* Number, which is 4 *l.* 05 *s* 02 *d.* muſt e reduced into *pence* by the Fifth Rule of Chap. V. nd then the *ſecond* Number being multiplied by the *hird*, the Product is 3996020, which being divided y the *firſt*, the Quotient is 35678 *pence*, which is qual to 148 *l.* 13 *s.* 02 *d.* and 84 remaineth; and ow that or any other ſuch like Remainder may be rdered, ſhall be taught by and by. See the following Operation.

℔. l. s. d. C. qr. ℔.
112 coſt 4—5—2——34—3—18
20 4
85 139
12 28
1022 *pence.* 1120
279
3910
1022
7820
7820
39100
112) 3996020
636
12) 35678 760
882
297|3 : 2 *d.* 980 84
Facit 148 : 13 : 2 $\frac{84}{112}$ 84 42

Example.

If 14 ℔. *of Sugar coſt* 5 s. 3 d. *what will* 46 C. *Weight coſt at that Rate?*

In this Example the *third* Number muſt be reduced into *Pounds*, becauſe the firſt Number is Pounds, and it makes 5152, and the ſecond Number muſt be reduced into Pence, making 63, then the ſecond Number being multiplied by the third, the Product is 324576, which being divided by (14) the firſt Number, the Quotient is 23184 Pence, for the Anſwer; which is equal to 96 *l.* 12 *s.* as by the following Operation appears.

```
lb.                     s.          d.              C.
14 ———————— Sugar 5 ———————— 3 ———————————— 46
                  12                            112
                  ——                            ———
                  63                             92
                                                506
                                               ————
                                               5152
                                                 63
                                              —————
                                              15456
                                             30912
                                             ——————
                                       14) 324576
                            2) 23184 ——— 44
                               —————      25
                               193|2      117
                              ——————       56
                                           ——
                              Facit 96 l. 12 s.
```

XI. When you have multiplied the ſecond Number by the third, and divided the Product thereof by the firſt, if any thing remain after Diviſion is ended, it is part of an Unit in the Quotient, and its Value may be found out thus, *viz.*

Multiply the ſaid Remainder by the Parts of the next inferiour Denomination that are equal to an Unit of the Quotient, and divide that Product by the firſt Number, ſo ſhall the Quotient be the Value of the ſaid Remainder in the ſaid Parts, and if any thing yet remain, multiply it by the parts of the next inferior Denomination, that are equal to an Unit of the laſt Quotient, and divide the Product by the ſaid Number, *&c.* Proceed thus till you have brought it as low as you deſire: And if any thing remain at laſt of all, it is a part of an Unit of the leaſt Denomination into which you reduce the ſaid Remainder, and muſt be placed according to the Direction given in the Fourth Rule of the Fifth Chapter.

In the third Example foregoing after the Diviſion is ended, there is a Remainder of 84, which ſheweth that the Anſwer to the Queſtion is not exactly 35678 Pence, or 148 *l.* 13 *s.* 02 *d.* as it is there found, but it is ſomething more; therefore to find the value of this Remainder 84, I multiply it by 4, (becauſe 35678 the ſaid Quotient is Pence) and the Product is 336, which I divide by the firſt Number 112, and the Quotient is 3 Farthings, without any other Remainder, and ſo is the true Anſwer to that Queſtion 148 *l.* 13 *s.* 02 *d.* $\frac{3}{4}$. Mind the Operation of the next Example.

Example V.

If 1 C. *Weight of Currans coſt* 2 l. 14 s. *what will* 24 C. 3 *qrs.* 16 ℔. *coſt at that rate?*

```
℔.      l.      s.              C.    qr.    ℔.
112 ——— 2 ——— 14               24 ——— 3 ——— 16
        20                      4
       ———                    ———
        54                     99
                               28
                              798
                              ———
                              199
                             ————
                             2788
                               54
                           ——————
                            11152
                            13940
                           ——————
             112)          150552
            ————            385
     ſhill. 1344            495
            ————            472
Facit { pence  2           ————
            ————             24
     farth. 2                12
                           ————
                            288
                           ————
                             64
                              4
                           ————
                            256
                             32
```

In the Work of the foregoing Example, you may obſerve that the ſecond Number is reduced no lower than Shillings, making 54 ; therefore the Quotient is 1344 Shillings, equal to 67 *l.* 4 *s.* and there is a Remainder of 24 : Therefore, to find out how many Pence is contained therein, I multiply it by 12, and the Product is 288, which being divided by 112, (becauſe that is the firſt Number) the Quotient is 2 Pence, and there is a Remainder of 64, which I multiply by 4, (to find its Value in Farthings) and the Product is 256, which I divide again by 112, and the Quotient is 2 Farthings, and there is a Remainder of 32, which, according to the 4th Rule of Chapter VI. is $\frac{32}{112}$ of a Farthing ; and ſo the Anſwer to the Queſtion is 67 *l.* 04 *s.* 2 *d.* 2 *qrs.* $\frac{32}{112}$. The like may be obſerved of any other.

Example VI.

If 24 *Yards of Camblet coſt* 4 l. 16 s. *I demand how many Yards I may buy for* 126 l? *Facit* 360 Yards. The Terms being ranked as is directed in the Sixth Rule of this Chapter, will ſtand thus, *viz.*

```
   l.  s.           yds.       l.
   4—16————————————24————————126
  20                           20
  ——                         ————
  96                         2520
                               24
                             ————
                            10080
                            5040
                            —————
                   96)      60480
                   ——         288
                   630        ———
                               00
```

Having thus demonſtrated the Reaſon of the *Single Rule of Three Direct* in the Six foregoing Examples, I ſhall proceed now to propoſe ſeveral Queſtions in the *Rule of Three* for the Learners Practice, and only ſet down their *Facits*, as a further Help to them in the working of their Queſtions.

Queſtion 1. If an Ounce of Silver coſt 5 s. 4 d. what will 46 *oz.* 15 *pw.* 12 *gr.* coſt? *Facit* 12 l. 09 s. 5 d. $\frac{288}{480}$.

Queſt. 2. If 12 Yards of Broad-cloth coſt 7 l. 6 s. I demand how much I ought to give for 26 Pieces, each Piece containing 27 Yards? *Facit* 427 l. 1 s.

Queſt. 3. If 18 Yards of *Cambrick* coſt 4 l. 13 s. I demand the Price of 73 Pieces, each Piece containing 34 Ells *Flemiſh*? The Ell *Flemiſh* being 3 quarters of a Yard? *Facit* 480 l. 17 s. 9 d.

Queſt. 4. If 17 C. 3 qrs. 17 ℔. of Tobacco coſt 145 l. 12 s. I demand how much the Ounce ſtands me in at that Rate? *Facit* 1 d. $\frac{2664}{32080}$ *per* Ounce.

Queſt. 5. If 112 ℔ of Lead coſt 15 s. 11 d. I demand the Price of 54 Fother, each being 19 C $\frac{1}{2}$? *Facit* 838 l. 0 s. 3 d.

Queſt. 6. When 7 ℔ of Tobacco coſt 5 s. 9 d. $\frac{1}{2}$, what will 30 C. weight coſt? *Facit* 139 l.

Queſt. 7. When the Tun of Wine coſt 51 l. 14 s. what coſt the Quart at that Rate? *Facit* 12 d. $\frac{1}{4}$.

Queſt. 8. At a Noble *per* Week, how many Months Board may I demand for 50 l.? *Facit* 22 Months and 2 Weeks.

Queſt. 9. A Grocer brought 30 Frails of Raiſins, each Frail weighing 91 ℔ weight, at 18 s. 8 d. *per* C. I demand how much they amount to? *Facit* 22 l. 15 s.

Queſt. 10. What comes the Commiſſion of 462 l. 11 s. 09 d. to, at 3 $\frac{1}{2}$ *per Cent.*? *Facit* 22 l. 9 s. 9 d.

Queſt. 11. What comes the Inſurance of 375 l. 9 s. 4 d. to, at 3 Guinea's *per Cent.* the Guinea's at 21 s. 9 *d.* $\frac{5}{8}$? *Facit* 12 l. 5 s. 6 d.

Queſt. 12. A Corn Factor bought 248 Quarters of Wheat for 511 *l.* 06 *s.* 8 *d.* for an 100 Quarters of which he gave 33 *s.* 04 *d. per* Quarter, I demand how much he gave *per* Qurrter for the Remainder? *facit* 2 *l.* 6 *s.* 6 *d.*

Queſt. 13. If a Piece of Cloth coſt 21 *l.* 5 *s.* I demand how many Yards were in the ſame, the Yard being valued at 12 *s.* 6 *d*? *facit* 34 Yards.

Queſt. 14. If a Piece of Cloath coſt 24 *l.* 5 *s.* 4 *d.* I demand how many Yards were contained in the ſame, when the Ell Engliſh is worth 17 *s.* 4 *d.*? *facit* 35 Yards.

Queſt. 15. Bought 124 Pieces of Camblet for the Sum of 987 *l.* 14 *s.* 8 *d.* at 4 *s.* 8 *d. per* Yard, I demand how many Yards there were in all, and how many Ells *Flemiſh* there were in a Piece? *facit* 4233 Yards, and 45 ½ Ells *Flemiſh per* Piece.

Queſt. 16. A Gentleman hath an Eſtate of 1224 *l.* *per Annum*, and his Expences one day with another amount to 1 *l.* 13 *s.* 4 *d.* I demand how much he layeth up at the Year's end to purchaſe with? *facit* 615 *l.* 13 *s.* 4 *d.*

Queſt. 17. A Gentleman expendeth one day with another 43 *s.* 6 *d.* ½, and at the Year's end layeth up 850 *l.* I demand his Annual Eſtate? *facit* 1644 *l.* 12 *s.* 8 *d.* ½ *per Annum.*

Queſt. 18. Bought 3 Hogſheads of Nutmegs bt *viz.* at 5 *s.* 7 *d.* the Ounce, I demand the Neat coſt thereof?

N°.

```
          C.     qr.     ℔.
N°. 1 —— 3 ——— 2 ——— 21
    2 —— 4 ——— 1 ——— 14
    3 —— 4 ——— 2 ——— 18
    ———————————————————
        12 ——— 2 ——— 25
  [illegible] 4
        ———————
            50
            28
        ———————
           405
           102
        ———————
          1425
            16
        ———————
          8550
         1425
        ———————
         22800 at 5 s. 7 d. F. 6365 l.
```

Queſt. 19. A Merchant conſigns to his Factor in *Spain* 188 Cloths, with Commiſſion for Sale at 23 *l.* 2 *s.* 2 *d. per* Cloth, and to make Returns from thence, the one half in Wines at 28 *l. per Tun*, and the other half in Sugar at 27 *s. per* C. *Weight*, I demand how much of each ought to be returned for the Cloths?

Anſwer, The whole Value of the Cloth is 4344 *l.* 7 *s.* 4 *d* the half whereof is 2172 *l.* 2 *s.* 8 *d* which will buy 77 $\frac{3884}{6720}$ Tuns of Wine at 28 *l per Tun*, and the other half will buy 1609 $\frac{8}{324}$ Hundred Weight of Sugar.

Queſt. 20. If 100 *l.* in 12 Months gain 6 *l.* Intereſt, what will be the Intereſt of 896 *l.* for the ſame time? *facit* 53 *l.* 15 *s* 2 *d.* $\frac{40}{100}$.

Queſt. 21. An Uſurer putteth out 889 *l.* to Intereſt, and at the end of 12 Months he receives for Principal and Intereſt 932 *l.* 16 *s.* I demand at what Rate *per Cent. per Annum* he received Intereſt? *facit* 6 *per Cent.*

Queſt. 22. I demand what Principal in 12 Months will gain 64 *l.* 10 *s.* at the Rate of 6 *per Cent.*? *facit* 1075 *l.*

Queſt. 23. An Orphan is indebted to his Guardian 51 *l.* and the Guardian having in his hands 100 *l.* of the Orphan's, it is agreed between them, that the Guardian ſhall keep the ſame in his Hands till the ſaid 51 *l.* be paid by the Intereſt thereof at 6 *per Cent. per Annum.* Now I demand how long he ought to keep the ſame at that Rate? *facit* 8 Years and 6 Months.

Gain and Loſs.

Queſt. 24. A Draper buys 2795 ½ Ells *Flemiſh* of Genting, at 22 *d.* ½ the Ell *Engliſh.* It is required to know at what Price the Cloth muſt be ſold out to gain 15 *l.* 10 *s. per Cent.*? Firſt find the Price it coſt by the Rule of Three, 157 *l.* 4 *s.* 11 *d.* Then ſay, if 100 *l.* give 15 *l.* 10 *s.* what will 157 *l.* 4 *s.* 11 *d.*? *facit* 24 : 7 : 5. which added to 157 : 4 : 11, makes 181 : 12 : 4. Or if 100 ℔. give 115 : 0. what will 157 : 4 : 11? *Fa.* 181 : 12 : 4. which is anſwered at one Operation.

Loſs and Gain.

Queſt. 25. If the aforeſaid Cloth were to be ſold, ſo as to loſe 15 *l.* 10 *s. per Cent,* Firſt ſubtract 15 *l.* 10 *s.* out of a 100 *l.* *facit* 84 *l.* 10 *s.* Then ſay, if 100 *l.* fall to 84 *l.* 10 *s.* what ſhall 157 *l.* 4 *s.* 11 *d.*? *facit* 132 *l.* 17 *s.* 6 *d.*

Fellowſhip.

Queſt. 26. Three Merchants Company; *A* his Stock was 175 *l.* 12 *s.* *B*'s 214 *l.* 19 *s.* 4 *d.* *C*'s 150 *l.* 11 *s.* 9 *d.* they have gained together 299 *l.*

11 *s.* 4 *d.* I demand each Man's part of *the ſaid Gain?* *Firſt add the ſeveral Stocks into one Total,* which makes 541 l. 3 s. 1 d. then make Three ſeveral Queſtions in the Rule of Three, *viz.*

l. s. d. l. s d. l. s. d.
If 541 : 3 : 1 give 209 : 11 : 4 what 175 : 12 : 0 *A*
If 541 : 3 : 1 give 209 : 11 : 4 what 214 : 19 : 4 *B*
If 541 : 3 : 1 give 209 : 11 : 4 what 150 : 11 : 9 C

facit

Add all the *facits* together, if it make up the *Money* to be *divided*, your *Sum* is true. If you have any Remains on the Diviſions, add them up into one Total, which divide by the common Diviſor, and the Quotient add to the loweſt Denomination.

Fellowſhip with Time.

Queſt. 27. Three Merchants Company. *A* his Stock was 109 l. 5 s. for 3 Months. *B* 450 l 7 s. for 4 Months. C. 147 l. 12 s. for 6 Months, they have gained 209 l. 7 s. 2 d. I demand each Man's part?

This is worked as the laſt precedent Queſtion, only each Man's Stock is multiplied by the time, *viz.*

A 109—05 *B* 450—7 C 147—12
3 *mo.* 4 *mo.* 6 *mo.*

A 327—15 *B* 1801—8 C 885—12
B 1801—08
C 885—12

l. s. d. l. s.
If 3014 : 15 gain 209 : 7 : 2 what will 327 : 15 *A*
If 3014 : 15 gain 209 : 7 : 2 what will 1801 : 08 *B*
If 3014 : 15 gain 209 : 7 : 2 what will 885 : 12 C

facit.

Add all the *facits* together, if it make the given Sum 209 *l.* 7 *s.* 2 *d.* your Work is true, otherwiſe falſe.

The Proof of the Single Rule of Three Direct.

To prove a Queſtion in the *Single Rule of Three Direct*, multiply the fourth Number (or Anſwer to the Queſtion) by the *firſt*, and if the Product thereof be equal to the Product of the *ſecond* and *third*, then is the Operation truly performed, otherwiſe not; as in the firſt Example of this Chapter, *viz.*

If 18 Yards coſt 72 Shillings, what will 596 Yards coſt at that rate? The Anſwer there found is 28608 Pence, which is the fourth Number. Now the Product of the firſt and fourth, *viz.* 28608 by 18 is 514944, which is equal to the Product of the ſecond and third, *viz.* 864 by 596, as you may ſee by the following Operation, where the ſecond Number, *viz.* 72 Shillings is reduced into 864 Pence.

```
yrds.          d.              yrds.              d.
 18 ——————————— 864 ——————————— 596 —————————— 28608
                596                                18
               ————                            ——————
               5184                            228864
              7776                             28608
             4320                              ——————
             ——————                            514944
             514944
```

And here Note, That if any thing remain after Diviſion is ended, it muſt be added to the Product of the *firſt* and *fourth* Numbers; and then muſt that Sum be equal to the Product of the *ſecond* and *third*. As in the third Example of this Chapter, which is, If 1 C. Weight of Tobacco coſt 4 *l.* 5 *s.* 2 *d.* what will 34 C. 3 *qrs*, 18 ℔ coſt?

The 3 given Numbers being reduced, are 112 *l.* 1022 *d.* and 3910 *l.* and the fourth Number or Anſwer to the Queſtion is there found to be 35678*d.* and the Remainder is 84, the Product of the ſecond and third is 3996020; and the Product of the firſt and fourth is 3995936 to which adding the Remainder, the Sum is 3996020, equal to the Product of the *ſecond* and *third*, which proves the Work to be true.

l.	*d.*	*l.*	*d.*
112	1022	3910	35678
		1022	112
		7820	71355
		7820	35678
		39100	35678
		3996020	3995936
		remains add	84
			3996020

C H A P. VIII.

The Single Rule of Three Inverſe.

I. THE *Single Rule of Three Inverſe*, is when the fourth Number, or Number ſought, ought to bear ſuch Proportion to the firſt, as the ſecond doth to the third.

II. When a Queſtion in the *Single Rule of Three* is ſtated, conſider whether the fourth Number (or Anſwer to the Queſtion) ought to be more or leſs than the ſecond Number, which upon a little Conſideration you may diſcover. If it ought to be more than the ſecond, then muſt the leſſer Extream be the Diviſor, and if it ought to be leſſer than the ſecond, then muſt the biggeſt of the Extreams be the Diviſor, (in this Caſe the firſt and third Numbers are called Extreams) and if it fall out that the third Number is the Diviſor, that Queſtion is ſaid to be of *The Single Rule of Three Inverſe*: As in the following Examples.

Example I,

If 30 *Men can build a Wall in* 32 *Days, I demand in how many Days* 60 *Men may do the ſame?*

The given Numbers being ranked according to the ſixth Rule of the ſeventh Chapter, will ſtand as followeth:

Men *Days* *Men*
30——32——60

Then I conſider whether 60 Men will do it in more or leſs Days than 32, and find that they will require leſs time than 32 Days, (for the more the Men, the leſſer the Time) wherefore 60 which is the biggeſt extream, muſt be the Diviſor, and the firſt and third muſt be multiplied together, and their Product, which is 960, being divided by the third Number 60, the Quotient is 16 days, and in ſo long time will 60 Men finiſh the ſaid Work. See the following Operation.

Men *Days* *Men*
30——32——60
30

6|0) 96|0

facit 16 *Days.*

Example

Example II.

If 100 l. *in* 12 *Months gain* 10 l. *for the Intereſt thereof, I demand what Principal will gain the ſame Intereſt in* 8 *Months?*

Here it being required what Principal will gain 10 *l.* in 8 Months, therefore muſt 100 *l.* Principal be the ſecond Number, according to the Directions in the Sixth Rule in the ſeventh Chapter, and the Numbers being ranked accordingly, will ſtand thus:

Mon. *l.* *Mon.*
12———100———8

Here I conſider, that the ſhorter the Time, the more muſt be the Principal to gain the ſame Intereſt; wherefore the leſſer Extream muſt be the Diviſor, which here is (8) the third Number, therefore the firſt and ſecond, *viz.* 12 and 100 muſt be multiplied the one by the other, and the Product is 1200, which being divided by (8) the third Number, the Quotient is 150 *l.* and ſo much will gain 10 *l.* Intereſt in 8 Months at 10 *per Cent. per Annum*: See the following Work.

12———100———8
12
8) 1200
facit 150

Example III.

Lent my Friend 120 l. *for* 6 *Months, he promiſing to do me the like Courteſie another time; and not long after I had occaſion for a Sum of Money for* 9 *Months, I demand how much he ought to lend me for that time, to retaliate my former Kindneſs?*

Facit 80 *l.* The longer the Time, the leſſer oug the Sum of Money to be.

Example IV.

A Footman perſorms a Journey in 12 *Days, wh the Day is* 15 *Hours long, I demand in how many Day he may perform the ſame when the Day is* 10 *Hou long?*

Facit 18 Days. The ſhorter the Days, the mor Days will the Journey require.

Example V.

How many Yards of Matting, that is half Yard wid is enough to cover a Floor that is 16 *Foot wide, and* 2 *Foot long?*

Facit $298\frac{2}{3}$ Yards of Matting.

Example VI.

Suppoſe that (according to the Statute) when th Buſhel of Wheat coſt 4 s. *the Penny-Loaf ought to weig Nine Ounces, I demand what the Price of the Buſh ought to be, when the Penny-Loaf weigheth* 12 *Ounces?*

Facit 3 s. *per* Buſhel.

Example VII.

If when the Tun of Wine coſt 45 l. *a certain Quantit worth* 25 s *is ſufficient for the Accommodation of* 1 *Men, I demand how many Men the ſame* 25 s. *worth wi ſuffice when the Tun is worth* 30 l.?

Facit 30 Men; for the cheaper the Wine, th more may be bought for the ſame Money.

Example VIII.

If when the Tun of Wine coſt 45 l. *a quantity wort* 50 s. *is enough for the Entertainment of* 40 *Men, I de mand the Price of the Tun when* 50 s. *worth is enough f* 90 *Men?*

Facit 20 l. *per* Tun.

Exampl

Example IX.

If 60 Ells at London *be equal to* 100 *Ells at* Antwerp, *and each Ell at* London *contains* 20 *Nails of an* Engliſh *Yard, I demand how many ſuch Nails the Ell of* Antwerp *contains? Facit* 12.

Example X.

If for 5 l. 3 s. 4 d. *I can have* 10 C. *Weight carried* 140 Miles, *I demand how many Miles I may have* 14 C. *weight carried for the ſame Money?* *Facit* 100 Miles.

The Proof of the Single Rule of Three Inverſe.

If the Product of the fourth Term multiplied by the Third, be equal to the Product of the Second multiplied by the Firſt, then is the Work truly performed, otherwiſe not.

Let us prove the firſt Example of this Chapter, *viz. If* 30 *Men can build a in Wall* 32 *Days, I demand in how many Days* 60 *Men may do the ſame?* The Anſwer is there found to be 16 Days, and the Four Terms being duly ranked, ſtand as followeth.

Men	*Days*	*Men*	*Days*
30	32	60	16
30			60
960			960

The fourth Term (16) being multiplied by (60) the third Term, is 960, which is equal to the Product of (32) the ſecond Term, by (30) the firſt.

CHAP.

CHAP. IX.

The Double Rule of Three Direct.

I. THE *Double Rule of Three*, is when there Five Numbers given to find out a Sixth proportion thereunto.

II. A Queſtion in the *Double Rule of Three* may reſolved by Two Single Rules of Three, or by O *Rule of Three compoſed of the Five given Numbers.*

III. When a Queſtion in the *Double Rule of Thr* may be ſolved by Two Single Rules of Three D rect, that Queſtion is ſaid to belong to the Doub Rule of Three Direct.

IV. Of the Five Numbers given in the *Double R of Three,* Three of them always imply a Suppoſitio as the other Two a Demand. As in the followin Example:

If 16 *Men can reap* 95 *Acres of Wheat in* 36 *Da I demand, how many Acres* 64 *Men may reap* in *Days?*

Here the Suppoſition is, *If, or ſuppoſe,* 16 *Men re* 96 *Acres in* 36 *days,* and the Demand is, *How m Acres* 64 *Men may reap in* 48 *Days?*

V. When you would ſolve a Queſtion in t *Double Rule of Three,* the given Numbers are to ſo ranked, that the Firſt and Third may be of o Denomination, and the Second Number muſt be the ſame Quality, Name, or Denomination wi the Number ſought; and Note, That the Firſt a Second Numbers muſt be always of the Suppo tion, and the Third of the Demand. So likewi muſt the Fourth Number be of the Suppoſi on, and the Fifth of the Demand and both one Denomination; ſo may each Queſtion be ſolv by Two ſingle Rules of Three, two different way s in the Queſtion foregoing, which being again epeated, is as followeth.

If 16 Men can reap 96 Acres of Wheat in 36 days, w many Acres may 64 Men reap in 48 Days? The umbers being ranked according to the foregoing irections, will ſtand as followeth.

Men *Acres* *Men*
16——————96——————64
Days 36——————————————48 *Days*

Or thus,

Days *Acres* *Days*
36——————96——————48
Men 16——————————————64 *Men*

VI. When a Queſtion in the *Double Rule of Three* to be ſolved at two ſeveral Operations in the ingle Rule of Three, the Anſwer to the firſt ueſtion muſt be the ſecond Number in the ſecond ueſtion, and the fourth and fifth Numbers muſt the firſt and third in the ſecond Queſtion.

So in the firſt Order of ranking the given Numers in the foregoing Queſtion, the three firſt Numers are 16 – 96 – 64, wherein is implied this ueſtion, *viz. If 16 Men can reap 96 Acres, How ch may 64 reap in the ſame time, viz.* in 36 Days? ultiply and divide according to the Directions ven in the ſeventh Rule of the ſeventh Chapter, d you will find the Anſwer to be 384 Acres; ſo at now I have found how many Acres 64 Men may ap in 36 Days; but by the Queſtion, it is required know how much they can reap in 48 Days?

Therefore I ſay again by the Single Rule of Three, *36 Days will reap 384 Acres, How many may be e in 48 Days?* Multiply and divide, and you will d the Anſwer to the Queſtion to be 512 Acres, d ſo many may 64 Men reap in 48 Days, if 16 en can reap 96 Acres in 36 Days. See the whole ork as followeth.

Men *Acres* *Men*
16————96————64
Days 36————————48 *Days*

16——96——64	*Days* *Acres* *Days*
96	36——384——48
384	384
576	3072
16) 6144	1536
134	36) 18432
facit 384 *Acr.* 64	43
0	*facit* 512 *Acr.* 72
	0

In the ſecond ſtating of the above Work, I multiply 384 by 48 to ſave Paper; for if the two Numbers be multiplied together, it is indifferent whether the Multiplicand or Multiplier be placed uppermoſt.

Or if the Five given Numbers of the foregoing Queſtion had been ranked according to the Second Method laid down at the latter end of the Fifth Rule, the Anſwer would have been the ſame, and the Operation as followeth.

Days *Acres* *Days*
36————96————48
Men 16————————64

36——96——48	16——128——64
56	128
288	512
432	768
36) 4608	16) 8192
100	19
facit 128 *Acr.* 288	*facit* 512 *Acr.* 32
0	0

I doubt not, but that by the Operation before go- g, this Rule is ſufficiently illuſtrated ; but for the arners further Experience herein, I ſhall propound veral other Examples, and only give their Anſwers, ving the Operation to the Induſtrious Learner.

Example 1. *I demand the Intereſt of* 75 l. *for* 18 *ths, after the Rate of* 6 per Cent. per Annum ?

This Queſtion may be more intelligibly ſtated us, *viz. If* 100 l. in 12 *Months gains* 6 l. *Intereſt, hat will* 75 l. *gain in* 18 *Months at that Rate ? facit* l. 15 s.

Example 2. *If* 12 *Men can reap* 48 *Acres of Wheat* 18 *Days, I demand how many Acres* 36 *Men may p in* 24 *days ? facit* 192 Acres.

Example 3. *If* 3 *Quarters of Malt is ſufficient for a ily of Six Perſons for two Months, How many Quar- s is enough for a Family of* 18 *Perſons for* 12 *Months ? it* 54 Quarters.

Example 4. *If* 8 *Reapers have* 3 l. 4. s *for* 4 *days k, I demand how much* 24 *Men will have for* 16 *s Work? Facit* 38 l. 8 s.

Example 5. *If* 336 ℔ *of Bread is ſufficient for* 56 *for* 12 *Days, I demand how much will ſerve* 460 96 *Days? Facit* 22080 ℔ of Bread.

Example 6. *If* 40 *Buſhels of Oats be enough for* 8 *ſes* 20 *Days, I demand how many Buſhels will ſerve Horſes* 12 *Days? Facit* 144 Buſhels.

Example 7. *A Banker took in* 250 l. *to pay Intereſt the ſame, and at the end of* 18 *Months he paid* 272 l. *for Principal and Intereſt, I demand at what Rate* Cent. per Annum. *he paid Intereſt.*

CHAP.

CHAP. X.

The Double Rule of Three Inverſe.

I. WHEN a Queſtion in the Double Rule o Three being ſolved at two Single Rules as is taught in the foregoing Chapter, hath one o thoſe Single Rules Inverſe, (for they are never bot Inverſe) then is that Queſtion ſaid to be of th *Double Rule of Three Inverſe.*

II. A Queſtion in the Double Rule of Three Inverſe, may be ſtated two ſeveral Ways, as well as Queſtion in the Double Rule Direct, and ſo the Inverted Proportion may be either in the firſt or ſecond Operation at pleaſure.

Example 1. *If a Footman travel 240 Miles in Days, when the Day is 10 Hours long, I demand in ho many Days he may travel 720 Miles, when the Day i 15 hours long?*

The given Numbers being ranked according t the fifth Rule of the Ninth Chapter, will ſtand a followeth:

Miles *Days* *Miles*
240———————8———————720
Hours 10——————————————15 *Hours*

Or thus,

Hours *Days* *Hours*
10———————8———————15
Miles 240——————————————720 *Miles*

Here, according to the firſt manner of ranking the given Terms, the Inverted Proportion is in the ſecond ſingle Operation.

III You may alſo work the Double Rule of Three, either *Direct* or *Inverſe* at one Operation, by the *Compound Rule of Five Numbers*, obſerving to rank the ſeveral Terms as is before taught in the fifth Rule of the Ninth Chapter.

IV. And if your Queſtion be of the Double Rule of Three Direct, multiply the Three laſt Terms together for Dividend, and the Two firſt for Diviſor, as in the following Examples, *viz.*

If 100 l in 12 *Months require* 6 l. *Intereſt, How much Intereſt will* 50 l. *require in* 10 *Months ?*

```
l.          mo.          l.          l.
100 ———————— 12 ———————— 6           50
10 ————————— 10                      10 m.
                                  ————————
                        100          500
                         12            6
                    ————————     ————————
 facit 2 l. 10 s. 12,00          30|00
                                 ————————
                                    2 10
```

V. But if your Queſtion be of the *Rule of Three Inverſe*, multiply the firſt, ſecond, and laſt Numbers together for Dividend, and the third and fourth for Diviſor, as in the following Example.

Example. *If 50 l. in 10 Months requires* 2 l. 10 s. *Intereſt, Of what Principal ſhall the Intereſt of* 6 l. *make in* 12 *Months?*

	l.	*mo.*	*l.*	*s.*
If	50	10	2	10
		12	6	

facit 100 *l.*

l.	*s.*	
		50
		10
		500
2	10	6
	12	
3|0)		30|0
facit		100

This laſt being a Queſtion in the Rule of Three Inverſe, according to the Directions given in the Fifth Rule of this Chapter I multiply the firſt, ſecond, and laſt Numbers together for a Dividend, which produces 30.0. Then I multiply 2 l. 10 s. my third Number, by 12, my fourth Number; and ſay 12 times 10 s. is 120, I put down a (0) and carry 6 *l.* to the place of Pounds, and ſay, 12 times 2 is 24, and 6 I carried, is 30 for my Diviſor. Then I divide, and the Quotient is 100 *l.* being the Principal that 6 *l.* Intereſt will make in 12 Months, which was to be proved.

But a more particular Application ſhall be made of the Double Rule of Three, when we come to treat of Simple Intereſt.

CHAP.

CHAP. XI.

Of Exchange.

HAving explained the Nature of the Rule of Three, and the manner of reſolving Queſtions therein, I am naturally led to treat of its particular Uſe in the Exchange of Coins.

In the Exchange of Coins, it is neceſſary that the *Par* or *Value* of the *Money* in each Place be exactly known: For the Word *Par* ſignifies to equalize the Money of Exchange from one *Place* with that of another *Place*. As when I take up ſo much *Money per* Exchange in one *place*, to pay the juſt *Value* thereof in another kind of *Money*, in another *place*, without having Reſpect to the *Price*-Current of Exchange for the ſame, but only to what the Money does currently paſs for in each place From whence may be eaſily found out the *Profit and Loſs* of all *Moneys* Drawn or Remitted *by Exchange*. But this *Par* being grounded principally upon the *Current Value* of Coin, the plenty and ſcarcity thereof, the Riſing and Falling, Inhancement and Debaſing of the ſame, it muſt neceſſarily follow, that the Value of Coin is ſubject unto Change. An Example whereof you have in *France*, where their Coin has been Changed, Inhanced and Lowered for ſeveral Times in a few Years; and in the Year 1702. the French Crown which was 60 Sous or 3 Livres, is now raiſed to 75 Sous, or 3 Livres 15 Sous.

The Denomination in which *England*, and the following Places exchange each with other, are, *viz.*

The Exchange of Monies ***from London*** to ***Antwerp, Amſterdam, Hamburgh, Liſle, Middleburgh*** and other Parts of ***Flanders***, and ***Holland*** is ***Valued on the Pound Sterling*** of 20 Shillings: That is, to ***pay***

after the Rate of ſo many Shillings, and Pence *Flemiſh* for every Pound Sterling.

The Exchange from *London* to *Paris*, *Roan*, and moſt parts of *France*, is *Valued* on the *French Crown* at 54 *d.* that is, to *pay* ſo many *Pence*, or ſo many *Shillings* and *Pence Sterling*, for the *French Crown*.

The Exchange from *London* to *Venice* is made on the *Ducat* at 52 *d.* Sterling, to pay ſo many *Pence* and parts of a *Penny Sterling* for every Ducat.

The Exchange from *London* to *Leghorn*, *Genoa*, *Cales*, *Madrid*, and other parts of *Spain*, is *made* on the *Dollar* or *Piece of Eight*, at 54 Pence Sterling, that is to pay ſo many *pence* or parts of a *penny Sterling* for every Dollar.

The PAR *at Antwerp*, *Amſterdam*, *Hamburgh*, *Liſle*, *Middleburgh* and other parts of *Flanders* with our Pound Sterling, is *thirty three Shillings* 4 *Pence Flem.* for a *pound Sterling*, which 33 Shillings 4 pence, do make 10 Guilders at 2 Shillings Sterling the Guilder, or 10 Livres *Tournois*.

The PAR at *Paris*, *Roan*, and other parts of *France*, has been reckoned ſometimes at 71 Sous the Crown of 3 Livres *Tournois*, generally at 60 Sous the Crown of 3 Livres, every Livre valued at 1 Shilling 6 pence Sterling, the Crown valued at 4 *s.* 6 *d.* Sterling.

The PAR at *Leghorn*, *Madrid*, *Cales*, *Genoa*, is at 54 *Pence Sterling* for the Dollar or Piece of Eight.

The PAR at *Venice* with our *Sterling Money* is at 6 Livres 4 Sous of *Venice per* Ducat, or 51 pence Sterling, ſometimes 52 pence

The Hamburg PAR is ſometimes reckoned at *four* Rix-Dollars and a half, which makes 32 Shillings *Flemiſh* for 20 Shillings Sterling.

The PAR at *Liſbon* is at 6 *s.* 8 *d.* $\frac{1}{2}$ Sterling on the Milrea or 1000 Reas.

The PAR at *Oporto* is the ſame as that at *Liſbon*.

Th

The Value of the moſt uſual Coins with which England *does chiefly Exchange, are,* viz.

Sterling Money.

		s.	*d.*	
Holland & Flanders.	1 Stiver is	0	1	$\frac{1}{5}$
	6 Stivers of 1 Shilling Flemiſh. is	0	7	$\frac{1}{5}$
	20 Stivers is 1 Guilder or	2	0	
	6 Guilders a pound Flem. of 20 *s.* is	12	0	
	33 Shill. 4 *d* Flemiſh is	20	0	
	1 *Zeland* common Dollar is	3	0	
	1 Ducatoon	6	0	
	1 Specie Dollar	5	0	

		s.	*d.*	*q.*
France.	12 Deniers, or 1 Soulz is	0	0	3$\frac{1}{5}$
	20 Soulz, or 1 Livre is	1	6	
	3 Livres, or 1 French Crown	4	6	

Sterling Money.

		s.	*d.*	
Spain.	A Mervid is about $\frac{1}{8}$ and $\frac{3}{4}$ of $\frac{1}{8}$ *d.*	0	0	$\frac{5}{37}$
	34 Mervides is a Rial, or about	0	4	$\frac{3}{4}$
	11 Rials Plate is 1 Ducat, or	4	4	$\frac{1}{4}$
	10 Rials Plate 1 piece of Eight, or	4	0	
	1 Rial *Copper* (is called) *Velloon* or	0	3	$\frac{1}{8}$
	15 Rials *Copper* 1 pc. of Eight is about	4	0	

☞ Note, *The Rial was formerly valued at* 6 *Pence Sterling, or very near it, and then* 8 *Rials was* 1 *Piece of* $\frac{8}{8}$, *but the Money is of late Years altered.*

Sterling Money.

		s.	*d.*
Portugal.	12 $\frac{1}{2}$ Reas of *Portugal*	0	1
	1 Mil-Rea, or 1000 Reas	6	8
	1 Feſtoon is	1	3

		Sterling Money. *s.*	*d.*
Italy.	1 Livre at *Legborn* is	0	9
	1 Crown Current at *Florence* is	5	3
	1 *Ducat de Banco* at *Venice*	4	4
	1 St. *Mark*	2	10
	1 *Palermo* Florin is	2	6
Germany.	1 Rix-Dollar of the Empire	4	5 ¼
	4 ½ Rix Dollars make 32 Flem. at *Hamburg*, &c.	20	0
	1 Guilder of *Noremburg* is	7	1

A Merchant in London *remits to* Rotterdam 375 *l.* 10 *s. Sterling, at* 34 *s.* 8 *d. Flemiſh for* 20 *Shillings Sterling, How many Guilders Flemiſh muſt be paid at* Rotterdam, *and what is gained* per *Exchange?*

s. — *s.* *d.* — *l.* *s.* *d.*

20 *Ster.* —— 34 : 8 *Flem.* what 375 : 10 : 0

12 — 20

416 — 7510

416

45060

7510

30040

2|0) 31241|60

2) 156208

2|0) 7810|4

3905

Guilders : *Stivers*

facit 3905 : 4

To find the *Gain* or *Loſs* in one pound, ſubtract 33 *s.* 4 *d.* out of 34 *s.* 8 *d.* the Courſe of Exchange, the Difference is 1 *s.* 4 *d. Flem. per* pound, and ſo much Gain is the Courſe of Exchange in our Favour.

If the Courſe of the Exchange be under Par, it muſt by parity of Reaſon become a *Loſs* to us, and then the Courſe of Exchange is to our prejudice.

The like is to be obſerved for the Coins Exchanged in all other Countries.

I will give but one Example of *Loſs* by Exchange, by which, with the foregoing Example of *Gain*, the Ingenious may with Eaſe, travel through the general Courſe of Exchange with all Countries.

A Merchant in *London* remits a Bill of Exchange to *Amſterdam* for 297 *l.* 15 *s.* Sterling, at 31 *s.* 3 *d. Flem.* for 20 *s.* Sterling, I demand how much *Flemiſh* Money was paid for the ſaid Bill in *Amſterdam*, and what is loſt *per* Pound by the Exchange?

s.	*s.*		*d.*		*l.*		*s.*	
20	31	:	3	*Flem.*	297	:	15	*Sterling.*

Guild. *Shill.*
Anſwer 2791 : 8 paid, and
2 *s.* 1 *d. Flem. per* pound loſt by
the Exchange.

PRACTICAL TABLE.

s.	*d.*	*q.*	*d.*	*q.*	℔.	*C.wt.*
10	0	$\frac{1}{2}$	6	$\frac{1}{2}$	56	$\frac{1}{2}$
6	8	$\frac{1}{3}$	4	$\frac{1}{3}$	8	$\frac{3}{4}$
5	0	$\frac{1}{4}$	3	$\frac{1}{4}$	28	$\frac{1}{4}$
4	0	$\frac{1}{5}$	$1\frac{1}{2}$	$\frac{1}{8}$	14	$\frac{1}{8}$
3	4	$\frac{1}{6}$	1	$\frac{1}{12}$	16	$\frac{1}{7}$
2	6	$\frac{1}{8}$			8	$\frac{1}{12}$
2	0	$\frac{1}{10}$			7	$\frac{1}{16}$
1	8	$\frac{1}{12}$				

I. *When the given Price is Pence, take your Parts in Shillings,* the Product divided by 20, gives the Anſwer in Pounds.

Or, You may bring it into Pounds, at once, by cutting off the laſt Figure, and by conſidering that 240 Pence is one Pound, whereof 8 *d.* is $\frac{1}{30}$. 6 *d.* is $\frac{1}{40}$. 4 *d.* is $\frac{1}{60}$. 3 *d.* is $\frac{1}{80}$ 2 *d.* is $\frac{1}{120}$.

		Example.
		254 ℔ of Tobac-(co at 1 *d.*
1	$\frac{1}{12}$	2¦1 : *d.*
	l.	1 : 1 : 2 *facit.*
		254 ℔ at 2 *d.*
d. 2		42 : 4
	l.	2 : 2 : 4 *facit.*

	716 Ells at 3 *d.*
d. $3\frac{1}{80}$	*s.* *d.* *l.* 8 : 19 : 0 *facit.*
	215 ℔ at 4 *d.*
d. $4\frac{1}{60}$	*s.* *d.* *l.* 3 : 11 : 8 *facit.*
	643 Gal. at 6 *d.*
d. $6\frac{1}{40}$	*l.* 16 : 1 : 6 *facit.*

The Three laſt Examples are brought into Pounds at one Operation, after which manner any Sum in Practice may be readily caſt up.

Here you ſee that 254 ℔ of Tobacco at 1 *d.* a Pound, divided by the $\frac{1}{12}$, gives 21 *s.* 2 *d.* and that divided by 20 (by cutting off the laſt Figures, and taking $\frac{1}{2}$ of it) gives 1 *l.* 1 *s.* 2 *d.* the Price of 254 ℔ of Tobacco; and for 2 *d* a ℔. take the $\frac{1}{6}$; becauſe 2 *d.* is the $\frac{1}{6}$ part of a Shilling, and for 3 *d.* a ℔ take $\frac{1}{4}$; and ſo for the others at 4 *d.* and 6 *d.*

II. *When the given price are ſuch pence as are no even Part of a Shilling*, take firſt the greateſt even part of a Shilling, and then part of that part; add them together, and divide the Product by 20, or cut off the laſt Figure, and take $\frac{1}{2}$.

d.		2121 Ells, at 5 *d.*
4	$\frac{1}{2}$	707
1	$\frac{1}{4}$	176 : : 9 *d.*
5		88 3 : 9
		44 : 3 : 9 *facit.*

		784 ℔. at 7 *d.*
6		392
1	$\frac{1}{2}$ $\frac{1}{6}$	65 : 4 *d.*
1		45 7 : 4 *d.*
		22 : 17 : 4 *facit.*

254 ℔ of Tobacco at 9 *d.* and 10 ¾ a ℔.

d.		
6	½	127
3	½	63 : 6
9		19.0 : 6
	¼	9 : 10 : 6 *fa*

d.		254 at 10 *d.* ¾
6	½	127 ſhill. in 254 ſixpences.
4	⅓	84—8 in 254 groats.
½	⅛	10—7 in 254 half pence.
¼	½	5—3½ in 254 farthings.
		22|7 : 6 ½
		11.7 : 6 ½ *fa.*

Demonſtration. In 254 ℔ of Tobacco at 10 *d.* ¾ a ℔, there muſt be 254 Sixpences, which is 127 Shillings, and 254 Groats, which is 84 *s.* 8 *d.* and 254 Half-pence, which is 10 *s.* 7 *d.* and 254 Farthings, which is 5 *s.* 3 *d.* ½; all theſe added together, make 227 *s.* 6 *d.* ½, which divided by 20, gives the *facit*, 11 *l.* 7 *s.* 6 *d.* ½.

		614 ℔. at 11 *d.*
6	½	307
4	⅓	204 : 8 *d.*
1	¼	51 : 2
11		56 2 : 10
		28|12 : 10 *facit.*

		563 ℔ at 12 *d.* ½
6	½	281 : 6 *d.*
4	⅓	187 : 8
1½	¼	70 : 4 ½
		53|9 : 6 ½
		26 : 19 : 6 ½ *facit.*

III *If the given Price be any Number of Pence above* 1 s. *and leſs than* 2 s. take the Aliquot parts in Pence, (as in the laſt Precedent) to which add the given Quantity for the 1 *s.* and proceed as before.

Example.

Example.

d.		254 ℔. at 15 *d.*
3	¼	63 : 6
		31|7 : 6
		15 : 17 : 6 *facit.*

	254 at 17 *d.*
⅓	84 : 8
¼	21 : 2
	35 9 : 10
	17 : 19 : 10 *facit.*

	264 *yds.* at 18 *d.*
½	32
	39|3
	19 : 16 : 0 *facit.*

	295 *gall.* at 19 *d.*
½	147 : 6
⅛	24 : 7
	46 7 : 1
	23 : 7 : 1 *facit.*

	672 ℔. at 22 *d.* ¾
½	336
⅓	224
⅛	42
	127|4
	63 : 14 : 0 *facit.*

	456 *Ells* at 23 *d* ¼.
½	228
⅓	152
¼	38
¼	9 : 6
	88|3
	44 : 3 : 3 : 6 *facit.*

In 672 ℔. at 22 *d.* ¾ a ℔. I take ½ for 6 *d.* the ⅓ for 4 *d.* and the ⅛ for the ¾, because ¾ is the ⅛ of 6 *d.* by which you will find that in 672 Sixpences there is 336 Shillings, and in 672 Groats there is 224 Shillings, and in 672 Three Farthings there is 42 Shillings.

IV. *If the given price be ſuch Shillings as are an even part of a pound* Sterling, take ſuch a Part of the given Quantity, and the Quotient is Pounds.

	Ells. *s.* *d.*		*yrds.*
	434 at 1 : 8		271 at 2 *s.*
$\frac{1}{12}$	36 : 3 : 4 *facit.*	$\frac{1}{10}$	27 : 2 : 0 *facit.*
	674 at 2 *s.* 6 *d.*		495 at 3 *s.* 4 *d.*
$\frac{1}{8}$	84 : 5 : 0 *facit.*	$\frac{1}{6}$	82 : 10 : 0 *facit.*

	Crowns.		*Dollars.*
	457 at 5 *s.*		612 at 4 *s.*
$\frac{1}{4}$	114 : 5 : 0 *facit.*	$\frac{1}{5}$	122 : 8 : 0 *facit.*
	295 at 6 *s.* 8 *d.*		372 at 10 *s.*
$\frac{1}{3}$	98 : 6 : 8 *facit.*	$\frac{1}{2}$	186 : 0 : 0 *facit.*

In this firſt Example of 434 Ells, at 1 *s.* 8 *d.* I take the $\frac{1}{12}$, becauſe 1 *s.* 8 *d.* is the $\frac{1}{12}$ of a *l.* and ſay, 12 in 43 is 3 times, reſt 7, which makes the 4 to be 74; then 12 in 74, is 6 times, reſt 2, which is 2 *l.* that I turn into Shillings, and ſay, 12 in 40 *s.* is 3 times, and there reſts 4 *s.* which I turn into Pence, and it makes 48 Pence; then 12 in 48 is 4 times, and the *Facit* is 36 *l.* 3 *s.* 4 *d.*

V. *If the given Price be ſuch Shillings and Pence as are no even Parts of a Pound*, multiply the given Quantity by the Number of Shillings, and take the Aliquot parts of Pence, and proceed according to the Second Rule of this Chapter.

```
     Ells.
     375 at 8 s. 6 d.
       8
     ------
     3000
 ½    187 : 6
     ------
     3|18|7 : 6
     ------
     159 : 7 : 6 Facit.
```

```
     Ells.
     493 at 15 s. 10 d.
      15
     ------
     2465
     493
 ½    246 : 6 d.
 ⅓    164 : 4 d.
     ------
     780|5 : 10
     ------
     390 : 5 : 10 facit.
```

```
     C      s.   d.
     295 at 12—9
      12
     ------
     3540
 ½    147 : 6
       73 : 9
     ------
     376|1 : 3
     ------
     188 : 1 : 3 facit.
```

```
     C      s.   d.
     214 at 7—11
       7
     ------
     1498
 ½    107
 ½     53 : 6
 ⅓     35 : 8
     ------
     169|4 : 2
     ------
      84 : 14 : 2 facit.
```

VI. *If your given Price be any Number of Pounds, Shillings and Pence;* Reduce firſt your Pounds and Shillings into Shillings, and proceed according to the laſt Rule.

	Pieces *l.* *s.* *d.*
	754 at 4—03—7
	83 20
	2262 83
	6032
½	377
⅛	62 : 10
	6302|1 : 10
	3151 : 1 : 10 *facit.*

	Tun *l.* *s.* *d.*
	176 at 3—7—10
	67 20
	1232 67
	1056
	11792
½	88
⅓	58 : 8
	1193|8 : 8
	596 : 18 ; 8 *facit.*

VII. *If your given Price be any Number of Pounds, and exceeding Five Pound,* then multiply your given Quantity by the Number of the Pounds, and take your Aliquot part in Shillings and Pence, *viz.*

		C. *l.* *s.* *d.*
		74 at 11—12—6
		11
s		814
10	½	37 *d.*
2½	¼	9 : 5 : 0
	l.	860 : 5 : 0 *facit.*

	hhead *l* *s.* *d.*
	394 at 16—16—3
	16
	2364
	394
½	197
½	98 : 10
¼	24 : 12 : 6
⅓	8 : 4 : 2
	6632 : 6 : 8 *facit.*

VIII. *If the given Quantity be any Number of* C. qrs. *or* ℔. *or* Tun. C. qrs. *and* ℔. *&c.* work as before where no part is, and take your Aliquot Parts in Quarters and Pounds, or in C. qrs. and ℔. and add them to your firſt Work. An Example or two will make this plain.

```
    C.          s. d.
    75 ½ at 22 : 6
    22     --------
   ----      11 : 3
    150
   150
½   37 : 6
    11 : 3
   ---- -----
   169|8 : 9
    84 : 18 : 9 facit.
   ----- ----
```

```
    C.         s.   d.
    63 ¾ at 12 : 10
    12      --------
   -----      6 : 5
   756        3 : 2½
½   31 : 6   -------
⅓   21 : 0    9 : 7½
     9 : 7½
   ---------
   8 |8 : 1½ facit.
   ---------
   40:18 : 1½ facit.
```

In the Example of 63 C. ¾ at 12 *s.* 10 *d.* the C. *weight*, I multiply the C. by 12 *s.* and take the parts in Pence for the odd Pence; then for the ¾ of a C. I firſt take the ½ of the price of a C. and that makes 6 *s.* 5 *d.* the Price of ½ a C. and then I take the ½ of that, which gives 3 *s.* 2 *d.* ½, the price of a *qr.* of a C. Add them together, it gives the price of ¾ of a C. which is 9 *s.* 7 *d* ½, and muſt be added to your firſt Work. Two or Three Examples more will make it familiar and eaſie to any Capacity.

84 C. 3 *qrs.* 11 ℔. at —— 21 *s.* 10 *d.*
21

84
168
$\frac{1}{2}$ 42
$\frac{1}{3}$ 28
18 : 6

185|2 : 6

92 : 12 : *facit.*

$\frac{1}{2}$ 10 : 11
℔. $\frac{1}{2}$ 5 : 5 $\frac{1}{2}$
7$\frac{1}{4}$ 1 : 4 $\frac{1}{4}$
4$\frac{1}{7}$ 0 : 9 $\frac{1}{4}$

18 : 6
The Price of
3 *qrs.* 11 ℔.

Tun. C. *qr.* ℔. *l.* *s.* *d.*
12 : 14 : 3 : 14 at 15 : 17 : 06 a *Tun.*
12

190 : 10 : 00
$\frac{1}{2}$ 7 : 18 : 9
$\frac{1}{5}$ 3 : 3 : 6
$\frac{1}{8}$ 0 : 7 : 11$\frac{1}{4}$
$\frac{1}{2}$ 0 : 3 : 11$\frac{1}{2}$
$\frac{1}{2}$ 0 : 1 : 11$\frac{3}{4}$

Facit 202 : 06 : 1$\frac{1}{2}$

CHAP. XIII.

The Order of Deducting TARE and TRET.

GROSS is the Weight of a Commodity, with the *Hogſheads*, *Cheſts*, *Box*, or whatever elſe contains it.

TARE is the Allowance given for the Weight of the Cask, Hogſheads, *&c.*

TRET is an Allowance of 4 ℔. in 104 ℔. for waſte and duſt on ſome ſort of Goods.

C. qr. ℔. ℔. ℔.
Exam. 11 *hhds.* qr. 45—3—15 *Groſs, Tare* 14 *per* 112
14—$\frac{1}{3}$ *how many* ℔. *Neat?*
5—2—26 *Tare.*

Facit 40—0—17 *Neat.*

I. Here 14 ℔. *Tare* being $\frac{1}{8}$ of 112 ℔. take $\frac{1}{8}$ of the *Groſs*, the Quotient gives the whole *Tare*, which ſubtract from the *Groſs*, gives the *Neat* weight.

The Operation is performed thus: Divide the *Groſs* by 8, ſay, 8 in 45, 5 times and 5 C. remains, which is 20 *qrs.* and 3 is 23; then 8 in 23, 2 times 7 *qrs.* remains, which turned into Pounds by 28, and added to the 15 ℔. makes 211 ℔. then 8 in 211 is 26 times. So the *Tare* is 5 C. 2. *qr.* 26. ℔.

Example

C. qr. ℔. s. d.
Example. 40 : 0 : 17 *Neat* at 22 : 6
22 ℔.
80 14 $\frac{1}{8}$ 2 : 9 : $\frac{2}{4}$
80 2 $\frac{1}{7}$ 0 : 4 : $\frac{3}{4}$
20 1 $\frac{1}{2}$ 0 : 2 : $\frac{1}{4}$
3 : 4 $\frac{3}{4}$ *facit* 3 : 2 : $\frac{1}{4}$
Price of 17 ℔.]
90| 3 : 4 $\frac{3}{4}$
45 : 3 : 4 $\frac{3}{4}$

If the *Tare* be 16 ℔. in 112 ℔. take $\frac{1}{7}$ of th *Groſs*, and work as before.

If 18 ℔. *per* 112 ℔. for *Tare*, take the Aliquo parts, *viz.*

For 6 ℔. take the $\frac{1}{7}$ } Add the *Tare* of 16, an
For 2 take the $\frac{1}{8}$ } the *Tare* of 2 together, th
—— Total ſubtract from the *Groſs*, and work
before.

℔. ℔. ℔.
If 20 in 112 for *Tare* } for 16 take $\frac{1}{7}$ ℔.
} for 4 take $\frac{1}{4}$ of 16

II. When an Allowance is made for *Tret* th (after the *Tare* is ſubtracted from the *Groſ*) th Remainder is called *ſubtle*, which divide by 26, b cauſe 4 ℔. is the 26th part of 104 (the Allowanc always given for *Tret*) the Quotient gives the *Tre* which ſubtracted from the *ſubtle*, gives the *Ne* weight.

Examp

C. qr. ℔. ℔. ℔. ℔. ℔.
Ex. 45 : 3—15 Gr. *Tare* 16 in 112 *Tret* 4 in 104
$16\frac{1}{7}$ 6 : 2 : 6 *Tare*

39 : 1 : 9 *Subtle* 4) 104
4
26
157
28

1265
314 26) 4405
180
4405 *pounds Subtle.* 169 245
169 *Tret*
11
4236 *Neat pound* at 6 *d.*

$6\frac{1}{2}$ 211 8 *d.*

105 : 18--0 *facit*

III. If the Allowance for *Tare* be 8 ℔. 10 ℔. 12 ℔. in 112, or any other leſſer Number, whether an Aliquot part of 112 or not, in ſuch Caſes, divide the *Groſs* into two parts by 2, which will make it half Hundreds, then ſay, 8 is $\frac{1}{7}$ of $\frac{1}{2}$ C. or if 12 ℔. in 112 ℔.

$8\frac{1}{7}$ $4\frac{1}{3}$ } When you have found your *Tare*, ſubtract it always out of the whole *Groſs*.

I might enumerate Examples, but theſe being ſufficient to inſtruct any ordinary Capacity in *Tare* and *Tret*,

I ſhall proceed to ſhew ſome other abbreviated ways of caſtiug up Goods and Merchandize.

CHAP.

CHAP. XIV.

For Retailers *of ſmall* Parcels, *as Mercer Linen and Woollen Drapers, Haberdaſhers Hats*, &c.

THE moſt abbreviated and ready Way, is t multiply the Price by the Quantity.

s. d.
Exam. Sold 7 Yards of Cloth, at 14 : 6 a Yar
7
facit l. 5 : 1 : 6

Say 7 times 6 is 42, which is 3 *s.* 6 *d.* ſet dow 6 *d.* and carry 3 *s.* to the place of Shillings, and ſay 7 times 4 is 28, and 3 I carry is 31, ſet down 1 and carry 3 Angels to the place of Tens of Shilling and ſay, 7 times 1 is 7, and 3 I carry is 10 Angel which 5 *l.* ſet a (o) in the Place of Shillings, an fix the 5 *l.* in the place of Pounds; ſo the Price o 7 Yards is 5 *l.* 1 *s.* 6 *d.*

s. d.
Exam. 2. Sold 11 Yards and ½ at 13 : 3
11
7 05 : 09
6 07
Facit l. 7 : 12 : 04

For half a Yard, take half of 13 *s.* 3 *d.* and ad to the Product of 11 Yards.

Examp

l. *s.* *d.*

Example 3. Sold 14 Yards and ⅝th at 1 : 07 : 10

7

9 : 14 : 10

2

19 : c9 : 08

4/8 — 1/2 — 0ↄ : 13 : 11
7/8 — 1/4 — 00 : 03 : 05 ¾

Facit l. 20 : 07 : C0 ¾

Find the firſt Price of 7 Yards *facit* 9 *l.* 14 *s.* 10 *d.* hich multiplied by 2, gives 19 *l.* 9 *s.* 8 *d.* the Price f 14 Yards; then take the Aliquot Parts of ⅝ for e Price of one Yard, as you ſee in the Operation :. he *facit* is 20 *l.* 7 *s.* 0 *d.* ¾.

l. *s.* *d*

Example 4. Sold 7 C. ½ of Currans at 2 : 13 : 6

7

18 : 14 : 6
1 : 06 : 9

Facit 20 : 01 : 3

Object. There are many Numbers under 100 that e not included in the Multiplication Table, or eing multiplied together, will not produce the iven Quantity; and ſo conſequently cannot be one by this new Way of Practice.

Anſwer.

Anſw. It's very true, there are ſeveral Numbers under 100 that no two Numbers multiplied together can produce them, ſuch as 13, 17, 19, 26, 29, 31, 34, 37, and many more.

Rule. In ſuch Caſes multiply by two ſuch Numbers, as being multiplied together, will come neareſt to ſuch odd Numbers; then multiply the Price by that part which wants to make up the given Quantity. An Example of which follows.

		s.	d.
5 *Ex.* 29 *Ells*, at		7 :	9
			7
	2—14 :	3	
			4
10 :	17 :	0	
	7 :	9	
facit 11 :	04 :	9	

Here I multiply by 7 and 4, becauſe 7 times 4 is 28, and for the odd Ell to make it 29, I add the Price of the Ell to the Product.

Facit 11 *l.* 4 *s.* 9 *d.*

Example 6. If 34 Ells at the ſame Price multiplied by 8 and 4 make 32, and multiply the Price of one Ell by 2, and add that to the Product, makes 34.

7 *Example*

C. qr. ℔. *l.* *s.* *d.*

7 *Example.* 15 : 3 : 7 at 4 : 15 : 06

5

23 : 17 : 06

3

71 : 12 . 06

2 : 07 : 09

1 : 03 : 10 $\frac{2}{4}$

5 : 11 $\frac{1}{2}$

l. 75 : 10 : 01 *facit.*

ds *ſold by* 112 ℔ *the* C. *weight.* 1. Account 2 *s.* 4 *d.* for every Farthing in the place of 1 pound weight

Exam. 1. At 3 $\frac{1}{2}$ the Pound, what 112

14

32 : 8 *d.*

2. Or multiply the Pence that 1 Pound weight ſt by 7, and divide by 15, the Quotient is the ice in Pounds of a Hundred weight.

Exam. At 5 *d.* the Pound, What coſt 112? Say, 15 in 32, 2 times, reſt 5, which is 100 Shillings, then 15 in 100, 6 times, reſt 10, it makes 120 *d* then 15 in 180 is 8 times; *facit* 2 *l.* 6 *s* 8 *d.*

7

15) 35

it *l.* 2--6--8

3. Multiply the Pounds in Money that 112 coſt 15, and divide the Product by 7, the Quotient es the Price 1 Pound coſt.

If

l. s. d.
If 112 coſt 2 : 06 : 8 What coſt ——— 1
5
———
11 : 13 : 4
3
———
7) 35 : 00 : 0 *Facit* 5 pence.

Goods ſold by 100. 4 Multiply the Pence that 1 ℔. co by 5, and divide by 12, the Product the Price in Pounds.

At 15 *d.* the Ounce, What coſt 100 Ounces?
5
———
12) 75
———
facit 6 *l.* : 5 *s.*

5. Multiply the Pounds in Money 100 ℔. weig coſt by 12, and divide by 5, the Quotient gives Pence the price of 1 Pound.

℔. l. s. ℔.
If 100 coſt 6 ——— 5 What coſt 1 ?
12
———
5) 75 : 00 *d.*
15 : *facit* 15

Things ſold by 120, *ſuch as Deals*, &c.

6. Multiply the Pence that 1 coſt by 2, and d vide by 4, the Quotient is the price of 120.

What coſt 120 Deals at 13 *d.* the Deal-board?

2
4) 26 *s.*

---

facit 6 : 10

7. Or divide the Pence that one is worth by 2, he Quotient will be Pounds.

What coſt 120 Yards of Ribbon at 5 *d.*?
facit 2 *l.* 10 *s.*

8. For Things ſold by 200, annex only a Cypher o the Sum of the given Price.

What coſt a Bale of Paper, Quantity 200 Reams, t 6 *s.* a Ream? *Facit* 60 *l.*

Wine or Oil ſold by the Tun of 252 *Gallons.*

9. So many Pounds the Tun coſt, abate ſo many hillings, and the Gallon will be worth ſo many ence.

Ex. If 252 Gallons coſt 25 *l.* What coſt 1 Gallon?

1 : 5

---

s. *d.*
23 : 15 *facit* 1. 11 $\frac{3}{4}$

Here 20 *s.* is valued at 1 penny, ſo that 23 *l.* 15 *s.* but 1 *s.* 11 *d.* $\frac{1}{4}$, the Price of 1 Gallon of Oil.

10. For Things ſold by 300, annex a Cypher to o Price of one, take half and add them together.

What coſt 300 Chaldron of Coals at 25 *s.*

250
125

375

11. For Things ſold by 500, put a Cypher to the rice, then double it, take half and add the two t together.

What coſt 500 Quarters of Corn, at 31 s. a Quarter?

310 s.
2

620
155

facit 175 Pound.

12. For things ſold by 900, put a Cypher and treble it.

What coſt [illegible] 9 ſ. ?
90
3

facit 270 Pound.

13. For things ſold by 600, put a Cypher, treble it, take half, and add the two laſt together.

What coſt 700 Gallons at 11 s.
110
3

330
55

facit 385 Pounds.

There are abundance of other ſhort ways, whic cannot well be compriſed in this little Tra These already given are ſufficient for any ingeni ous inventive Head to lay a good Foundatio from whence he may raiſe what Structure h pleaſes.

CHAP

CHAP. XV.

INTEREST is either *Simple* or *Compound*.

Simple Intereſt is that which ariſeth, or is computed from the Principal only. And here all Queſtions are done by the Double Rule of Three (called the Compound Rule of Five Numbers) or Practice.

Example. What will the Intereſt of 275 *l.* 11 *s.* 3 *d.* come to for a Year, at 6 *l. per Cent*?

State your Queſtion by the Rule of Three, and ſay,

```
          l.                 l.    s.   d.
If 100 gain 6, What will 275 : 11 : 3
                                    6
                        -----------------
                        l. 16|53 : 07 : 6
                        s. 10|67 : 20
         l.   s.  d.       -------  12
   facit 16 : 10 : 8 : 10/100 d.  8|10
```

Here 275 *l.* 11 *s.* 3 *d.* Principal, is multiplied by 6*l.* (the Intereſt) being the middle Number, and divided by 100 the firſt Number, by cutting off Two Figures in the Dividend; reſt 53 *l.* which multiply by 20, gives 1067 Shillings, which divided again by 100 as before, reſt 67 *s.* which multiplied by 12, and divided as before, gives 16 *l.* 10 *s.* 8 *d.* the Intereſt for 1 Year.

l. *s.* *d.*

275 : 11 : 3 for a Year, at 5 *l. per Cent,*

5

13|77 : 16 : 3

20

15|56

12

6|75

facit 13 : 15 : 16 $\frac{75}{100}$

l. *s.* *d.*

275 : 11 : 3 at 5 $\frac{1}{2}$ *per Cent,*

5

1377 : 16 : 3

$\frac{1}{2}$137 : 15 : 7 $\frac{1}{2}$

15|15 : 11 : 10 $\frac{1}{2}$

20

3|11

12

1|42

4 *l.* *s.* *d.*

1|70 *facit* 15—3—1 $\frac{1}{4}$ $\frac{70}{100}$

What comes the Inſurance of 975 *l.* 13 *s.* 4 *d.* to, at 4 Guinea's *per Cent.* ?

l. *s.* *d.*
975 : 13 : 4
4 : 6*s.*

3902 : 13 : 4
$5\frac{1}{4}$ — 243 : 18 : 4
$1\frac{2}{3}$ — 48 : 15 : 8

41|95 : 07 : 4 *l.* *s.* *d.*
20 *facit* 41 : 19 : 0 $\frac{3}{4}\frac{52}{100}$.
19|07
12
00|88
4
3|52

l. *s.* *d.*
275 : 11 : 3 at 5 *per Cent*. for 14 Months.

l. *s.* *d.*
The Int. of 1 Year is 13 : 15 : 06
2 Months $\frac{1}{6}$ ——— 2 : 5 : 11

facit 16—01—05 Int. for 14 Mon.

l. *s.* *d.*
275 : 11 : 3 at 5 *per Cent*. for 3 Years, 5 Months, 20 Days.

The Intereſt of a Year is, which multiplied by the 3 Years, and take Aliquot Parts for 5 Months and 20 Days, as you ſee in the Operation.

l. *s.* *d.*
—13—15—06
3

m 41— 6— 6
4 $\frac{1}{3}$ 4 1—1—10
1 $\frac{1}{4}$ 1— 2—11 $\frac{1}{2}$
Days 10 $\frac{1}{3}$ 0— 7 — 7 $\frac{3}{4}$
10 0— 7— 7 $\frac{3}{4}$

Produces *facit* 47—16— 7

The

The way uſed by Bankers for caſting up Intereſt, is generally by Days; thus,

They bring the Principal Money into Pence, and multiply it by the Days it is out at Intereſt, and divide by 6083 for 6 *per Cent.* and 7300 for 5 *per Cent.* (which are the Days of a Year multiplied by 100, and divided by the Rate of Intereſt) An Operation in the Compound Rule of Five Numbers, *viz.*

If 100 *l.* in 365 Days gain 6 *l.* Intereſt, What will 75 *l.* gain in 94 Days?

```
        Example. 275 : 11 : 3 at Intereſt 70 Days at
                  20                       (6 per Cent.
                 ----     12) 761 pence (6) 36500
                5511          ---          ---------
                  12          6|3 : 5         6083
                ----          -------
               66135    facit 3 3 : 5
                  70
               -----
  6083) 4629450
  -----   37135
   761     6370
          -----
            287
```

Example. 100 *l.* at Intereſt for 75 Days at 5 *per* C.

```
          20
    ————————— facit 20 s. 6 d.
        2000
          12                    365
    —————————                   100
       24000               ——————————
          75               5) 36500
   ——————————              ——————————
    12 000                     7300
   168000
   ——————————          73|00)18000|00
   18000|00           ——————————340
  ——————————             12)246|480
                       ——————————————
               facit 20 : 6 : 42
```

CHAP. XVI.

Compound Intereſt *is that which ariſeth from the* Principal, *and alſo from the* Intereſt *thereof, and therefore is called* Intereſt *upon* Intereſt.

THIS ſort of Intereſt is counted very unlawful, and is ſeldom or never allowed, but by particular Contract or Valuation of Money ſometimes on Purchaſes.

The beſt Way of working this ſort of Intereſt is by Decimals.

Example. 275 *l.* 11 *s.* 3 *d.* forborn 5 Years, at 6 *per Cent per Annum*, Intereſt upon Intereſt, What will the ſame amount to?

Reduce the 11 *s.* 3 *d.* into a Decimal Fraction, according to the Third Rule of the Eighteenth Chapter of this Book.

11 *s.* 3 *d.* $\frac{135}{240}$ of a Pound *Sterling.*

Which brought into a Decimal Fraction, is 5625, the Operation of the Queſtion is, *viz.*

If 100 gain 6, What will 275, 5625——6
16, 5337

1 Year——292, 0962——6
17, 5257

2 Year——309, 6219——6
18, 5773

3 Year——328, 1992——6
19, 6919

4 Year——347, 8911——6
20, 8734

5 Year——368, 7645——6

Facit 368 *l.* 15 *s.* 4 *d.*

Here the third Number is multiplied by 6, the ſecond Number, and divided by 100 the firſt Number, which is done by ſetting out the two firſt Figures towards the Right-hand, and caſting them away as you multiply them, to abbreviate the Work of Multiplications, which would be very large, were they all ſet down, where 15, or more Years Intereſt is forborn. beſides 4 or 5 Places of Decimals will be correct to a Farthing or little more, ſo that the *ſacit* makes 368 *l.* 15 *s.* 4 *d.* the Decimal Fraction being valued according to the Sixth Rule of the Eighteenth Chapter of this Book.

CHAP. XVII.

Rebate *or* Diſcount, *is when a Sum of Money due at any time to come, is ſatisfied by the Payment of ſo much preſent Money, as being put forth at a certain* Rate of Intereſt *for the Time being, will be equal to the Sum firſt due.*

IN *Rebate,* 12 Months is the *firſt* Number, the Rate of Intereſt the *ſecond,* and the Time propoſed the *third* Number.

Then ſay, If 100, and that *facit* (added together) abate that *facit,* what ſhall the given Sum Rebate?

The Quotient or Quotients ſhew the Rebate; which ſubtracted out of the given Sum ſhews the *Money* to be paid preſently.

Examp What will the Rebate of 795 *l.* 11 *s.* 2 *d.* come to for 11 Months, at 6 *l. per Cent.?*

If 12 Months give 6 *l.* What will 11 Months? *facit* 5 *l.* 10 *s.* Then

If 105 *l.* 10 *s.* Rebate 5 *l.* 10 *s.* What will 795 *l.* 11 *s.* 2 *d.*? *facit* 41 *l.* 9 *s.* 5 *d.*

Examp. 2. The Rebate of 765 *l.* 11 *s.* 2 *d.* come to for 17 Months at 6 *per Cent.*

If 12 Months give 6 *l.* What will 17 Months? *facit* 8 *l.* 10 *s.*

If 108 *l.* 10 *s.* Rebate 8 *l.* 10 *s.* What 795 *l.* 11 *s.* 2 *d.*? *facit* 62 *l.* 6 *s.* 5 *d.*

Example 3. Sold Goods for 795 *l.* 11 *s.* 2 *d.* to be paid at 2, 3 Months (*that is half at 3 Months, and the other half at 3 Months after that.*) If all the *Money* be paid preſently, what muſt be diſcounted?

Firſt, Divide the given Sum into Two Parts, according to the Time of Payment, as you ſee here; then ſay,

l.	*s.*	*d.*
795	11	2
397	15	7

If 12 Months gives 6 *l.* what will 3 Months? *facit* 1 *l.* 10 *s.* 2 *d.*

If 101 *l.* 10 *s.* abate 1 *l.* 10 *s.* what will 397 *l.* 15 *s.* 7 *d.* *facit* 5 *l.* 17 *s.* 6 *d.*

If 12 Months give 6 *l.* what will 6 Months give? *facit* 3 *l.*

If 103 *l.* abate 3 *l.* what will 397 *l.* 15 *s.* 7 *d.*? *facit* 11 *l.* 11 *s.* 8 *d.*

Add the Sum of the Rebates together, and ſubtract it out of the given Sum, gives the *Money* to be paid preſently.

795 : 11 : 2

l. *s.* *d.*

397 : 15 : 7 for 3 Months ——— 5 : 17 : 6

397 : 15 : 7 for 6 Months ——— 11 : 11 : 8

All the Rebate 17 : 09 : 2

The *Money* to be paid preſently 778 : 02 : 0

Exam. 4. Sold Goods for 795 *l.* 11 *s.* 2 *d.* to be paid at 3, 2 Months, if all the *Money* be paid preſently, what muſt be diſcounted?

Divide the given Sum into three parts, and work as before, *facit* 15 *l.* 10 *s.* 11 *d.* $\frac{1}{2}$.

Exam. 5. Sold Goods for 795 *l.* 11 *s.* 2 *d.* to be paid at 4, 1 Months, if all the *Money* be paid down, what muſt be diſcounted? *fac.* 9 *l.* 15 *s.* 9 *d* $\frac{1}{3}$.

Divide your Money into four Payments, then work as before, *viz.*

12 *mo.*——6 *l.* —— 1 *mo.* —— *facit* 10 *s.*
100 *l.* 10 *s.* abate 10 *s.* what will 198 *l.* 17 *s.* 9 *d.*
facit 19 *s.* 9 *d.*

12 *mo.*——6 *l.* —— 2 *mo.* —— *facit* 1 *l.*
101 *l.* 1 — *l.* — 198 *l.* 17 *s.* 9 *d.* *fa.* 1 *l.* 19 *s.* 4 *d.*

12 *mo.*——6 *l.* —— 3 *mo.* —— *facit* 1 *l.* 10 *s.*
101 *l.* 10 *s.* abate 1 *l.* 10 *s.* what 198 *l.* 17 *s.* 9 *d.*
facit 2 *l.* 18 *s.* 9 *d.*

12 *mo.* —— 6 *l.* —— 4 *mo.* —— *facit* 2 *l.*
102 *l.* abate 2 *l.* what will 198 *l.* 17 *s.* 9. *d.*
facit 3 *l.* 17 *s.* 11 *d.*

l. *s.* *d.*
0 : 19 : 9
1 : 19 : 4
2 : 18 : 9
3 : 17 : 11
————
9 : 15 : 9

l. *s.* *d*
795 : 11 : 2
rebated 9 : 15 : 3
————
Facit 785 : 15 : 9
to be paid down.

CHAP.

CHAP. XVIII.

FRACTIONS,

Are of Two Kinds, { *VULGAR*
and
DECIMAL.

A *VULGAR FRACTION* is cauſed by Diviſion of whole Numbers, the Remainder of which being leſs than the Diviſor, called the Numerator, is always the Dividend, and the Denominator is the Diviſor.

3 Numerator.
4 Denominator.

DECIMAL FRACTION is ſuch a *one,* whoſe Denominator is underſtood, and therefore need not be expreſſed: And is an *Unit* with as many Cyphers following it, as there be Figures and Cyphers in the Numerator.

Decimal Fractions, whether they ſtand alone, or be joined with Integers, have always a Comma, or Point before them to diſtinguiſh 'em from Integers; as 5, 360042.

In *Decimals* the *value* of every Figure or Cypher *decreaſes* by a Ten-fold Proportion from the Unit's Place towards the *right Hand,* as the whole Numbers do increaſe the value towards the *left hand*, by the like Proportion, as you may ſee in the following Table.

Whole Numbers.	Decimals.
6 *C Thou.*	2 *Tenths.*
5 *X Thou.*	3 *Hund.*
4 *Thou.*	4 *Thou.*
3 *C.*	5 *X Thou.*
2 *X.*	6 *C Thou.*
1 *Units.*	

Cyphers before Integers, and at the end, or right hand of Decimals are of no Value; but after Integers and before Decimals they have their Value; for in Integers they increaſe, and in Decimals they diminiſh the Value of the other Figures joined with them.

In Integers 005 is but 5, and 004 is but 4, and 06 is but 6.

But in Decimals, ,005 is $\frac{5}{1000}$, and ,034 is $\frac{4}{1000}$, and ,06 $\frac{5}{00}$.

And again, in Integers 500 is five hundred, and 400 is four hundred.

In Decimals 500 is but 5, and 400 is but 4, *&c.*

Next to Abbreviation and Valuation of *Vulgar Fractions*, there is little required; but to know how to bring a *Fraction* of a *leſſer* Name into the Fraction of a *greater* Name: And to reduce *Fractions* of divers unequal *Denominations* to one Common *Denominator*, which being well underſtood, you may with as much eaſe *Add Subtract*, *Multiply* and *Divide* a *Fraction*, as you can a whole Number.

In *Decimals* a Fraction is ſeldom abbreviated; therefore,

1. *To abbreviate any Vulgar Fractions,* find ſuch a Number for dividing both the Numerator and Denominator thereof, ſo that no Remainder be on either of the Diviſions.

Example. Abbreviate $\frac{96}{120}$ into $\frac{84}{105}$ its loweſt Term.

Say, 12 in 96, 8 times, and 12 in 120, 10, then the Fractions is $\frac{8}{10}$, then ſay, 2 in 8, 4 times, and 2 in 10, 5 times, then the Fraction is $\frac{4}{5}$. ſo that 4 is to 5, as 96 to 120.

2. *To know what part of a Pound Sterling any Number of Shillings and Pence are,* bring the Shillings and Pence into Pence for a Numerator, and place 240 under it (the Pence of one pound) for a Denominator.

Example. What part of a *l.* is 11 *s.* 3 *d?*

$$\frac{12}{135} \quad \textit{facit} \ \frac{135}{240}.$$

3. *To reduce Vulgar Fractions into Decimals,* Add Cyphers at pleaſure to the Numerator, and divide by the Denominator. *Example,* viz.

Reduce 11 *s.* 3 *d.* into a Decimal Fraction.

```
   12          24|0)  1350000
   ——          —————   150
  135                   60
   ——    facit 5625    120
  240                  ———
                         0
```

Example. Reduce $\frac{4}{3}$ into a Decimal Fraction.

5) 4000

,800 *facit* ,800

4. *To value a Vulgar Fraction;* Multiply the Integer into the Numerator, and divide by the Denominator.

What is the $\frac{5}{8}$ of a Pound *Sterling*? 20 *s.*

5

8|100 *d.*

facit 126

s. *d.*

An Ell worth 7 : 9 What is $\frac{2}{5}$ worth?

2

5) 15 : 6

facit —3 : 1 $\frac{1}{3}$.

5. *To value a mixt Number,* Multiply the mixt Number by the Numerator, and Divide by the Denominator. *Example.* viz.

l. *s.* *d.*

A Ship worth 794 : 11 : 9 What is $\frac{5}{8}$ worth?

5

8) 3972 : 18 : 9

facit 496 : 12 : 4$\frac{1}{8}$

6. *To value a Decimal Fraction, expreſſing Coin*; every *Prime* or *Unit* in the firſt place is 2 *s.* value, every 5 in the ſecond place is 1 *s.* and the reſt Farthings; but if they exceed $\frac{25}{46}$, there muſt be one Farthing abated.

Reduce $\frac{7}{9}$ of a Pound into a Decimal Fraction.

9) ,700000

,77777

Here 7 *Primes* is 14 *s.* and 5 taken out of the ſecond place is 1 *s.* which makes 15 *s.* then 2 remains, which is 27, to the *thirds*, or place of Farthings, out of which abate 1 for $\frac{25}{4}$, it makes *facit* 15 *s.* 6 *d.* $\frac{1}{2}$, which is the $\frac{7}{9}$ of a Pound *Sterling.*

7. *To reduce Vulgar Fractions to a Common Denominator*, Multiply the *Numerator* of each Fraction into every *Denominator*, except its own, which makes that Product of a *New Numerator*; then multiply all the *Denominators* continually together, and that Product is a *Common Denominator* to all the *New Numerators. Example, viz.*

l. *l.*

Reduce $\frac{2}{3}$ and $\frac{3}{4}$ to a *Common Denominator*, *facit* $\frac{8}{12}$ and $\frac{9}{12}$.

Here 12 is the *Common Denominator* to both the *New Numerators, viz.* 8 and 9 and you find that 8 is to 12, as 2 to 3, and 9 is to 12, as 3 to 4.

So that $\frac{8}{12}$ is — to $\frac{2}{3}$, and $\frac{9}{12}$ — to $\frac{3}{4}$.

Reduce $\frac{3}{4}$, and $\frac{5}{6}$, and $\frac{7}{8}$, of a *l.* to a *Com. Denom.*

4			
6	18	40	42
—	8	4	4
24			
8	144	160	168
192	192	192	162

To prove your Work, Divide your *new Numerator* by the *Numerator* of that Fraction, and Divide the *Common Denominator* of the Fraction by the *Denominator*, if both Quotients are equal, your Work is true.

Example. $\frac{144}{192}$ $\frac{48}{48}$ here 144 divided by 3, make 48, and 192 divided by 4, gives 48, which was to be proved. Or, you may prove your Work by *Abbreviation of Fractions*; but that is attended with much Difficulty, where 4 or more Fractions are reduced to a *Common Denominator.*

Now this *Reduction of Fractions* is of little Uſe, otherwiſe than to prepare a Fraction to be either *Added*, *Subtracted*, *Multiplied*, or *Divided.*

As if the $\frac{3}{4}$ and $\frac{5}{6}$ and $\frac{7}{8}$ *l.* were to be added together, Reduce them firſt into a *Common Denominator*, as in the laſt Rule, it makes *facit* $\frac{141}{192}$ and $\frac{160}{192}$ and $\frac{168}{192}$. Add all the *New Numerators* together, make 472, which divided by 192, the *Common Denominator*, makes *facit* 2 *l.* $\frac{88}{192}$. as in the following Example.

Addition of Vulgar Fractions. { 144
160
168

192) 472
2) 88 *l.* *s.* *d.*

facit 2 $\frac{88}{192}$, or 9 : 2

And if the $\frac{3}{4}$ and $\frac{5}{6}$ and $\frac{7}{8}$ *l.* were to be add together in *Decimals*, reduce them firſt into *Decim* *Fractions*, according to the *Third Rule* of this Cha ter, and the Operation ſtands, *viz.*

c000

Addition of Decimals. { $\frac{3}{4}$,75
$\frac{5}{6}$,8333
$\frac{7}{8}$,8 5

Say 4 in 30 is 7 time and 4 in 20 is 5 times, a ſo for the reſt.

l. *s.* *d.*
facit 2 ,4583, or, 2 : 9 : 2

By this Addition you ſee how much leſs Work made by *Decimals* than is in *Vulgar Fractions*, a how eaſie their Value is found out according to t *Sixth Rule* of this Chapter.

8. *To reduce Compound Fractions*, or *Fraction* *a leſſer Name into the Fractions of a greater*; Multip the *Numerators* together for a New *Numerator*, a the *Denominators* multiply together for a New *D* *nominator*.

Reduce $\frac{3}{4}$ of a Penny into the proper Fraction a Pound *Sterling*.

Say, $\frac{3}{4}$ of $\frac{1}{12}$ of $\frac{1}{20}$, or $\frac{3}{4}$ of $\frac{1}{240}$, *facit* $\frac{1}{960}$.

9. *To reduce a mixt Number of a leſſer Name* *the Fraction of a greater*; Reduce the mixt Numb into an improper Fraction, and work as before:

Red

Reduce 3 *d.* $\frac{1}{2}$ into the proper Fraction of a pound (*Sterling.*

$\frac{7}{2}$ of $\frac{1}{12}$ of $\frac{1}{20}$, or $\frac{7}{2}$ of $\frac{1}{240}$, *facit* $\frac{7}{480}$.

By the ſame *Rule* you may Reduce any ſort of Weight or Meaſure.

For Compound Fractions, their uſe is chiefly to bring Fractions of divers Denominations to one and the ſame Denomination.

As if the $\frac{3}{4}$ of a Penny. $\frac{2}{3}$ of a Shilling, and $\frac{7}{8}$ of a Pound were added together.

The $\frac{3}{4}$ of a Penny muſt be reduced into the Fraction of a Pound, and the $\frac{2}{3}$ of a Shilling, muſt be reduced into the Fraction of a Pound thus:

$\frac{3}{4}$ of $\frac{1}{240}$ *fac.* $\frac{3}{960}$
$\frac{2}{3}$ of $\frac{1}{20}$ *fac.* $\frac{2}{60}$

Then the Fractions to be added, are $\frac{3}{960}$, and $\frac{2}{60}$, and $\frac{7}{8}$, which reduce to a Common Denominator, and add them together, either by Decimals or Vulgar Fractions.

CHAP. XIX.

ADDITION of FRACTIONS.

1. IF *the Fractions to be added have one Common Denominator*, Add all the Numerators together, and divide the Product by the Common Denominator.

Example. Add $\left\{\begin{array}{c}\frac{8}{12}\\ \frac{5}{12}\\ \frac{7}{12}\end{array}\right\}$ of a Pound together.

```
———
12) 20
———
facit 1 8/12
```

2. *If the Fractions to be added be of different Denominators*, Reduce them to a Common Denominator according to the *Seventh Rule* of the laſt Chapter and proceed as before.

Example. Add $\frac{7}{8}$ and $\frac{3}{4}$, and $\frac{2}{3}$ *l.* together.

```
  8 —    —    8
  4 28   24   8
  — 3    3    —
 32 —    —    64
  3 84   72   —
  — —    —    96
 96 96   96
```

To add $\frac{7}{8}$ and $\frac{3}{4}$ and $\frac{1}{3}$ *of a Pound in Decimals*, Reduce them into Decimal Fractions, according to the *Third Rule* of the laſt Chapter, and add them up as in whole Numbers, keeping the Place of Unit just under each other.

```
      copo
      ————
     7/8  ,875
Add  3/4  ,75
     2/3  ,6666
     ——————        l.  s.  d.
     2,2916 facit  2 : 5 : 10
```

CHAP. XX.

Subtraction of Fractions.

I. TO *Subtract Fractions of different Denominators*, Reduce them to a Common Denominator, and Subtract the leſſer Fraction from the greater.

Example. From $\frac{3}{4}$ *l.* take $\frac{2}{3}$ *l.* from $\frac{9}{12}$
— — take $\frac{8}{12}$
9 . 8 —
facit $\frac{1}{12}$

II. *If you have a mixt Number, (or Integer and Fraction) and the Fraction to be ſubtracted be greater than the Fraction from which you are to Subtract:* Borrow an Integer from the mixt Number, and work as in the Subtraction of whole Numbers.

Examp. From 11 $\frac{2}{3}$ — $\frac{8}{12}$
2 $\frac{3}{4}$ — $\frac{9}{12}$
———
8 $\frac{11}{12}$

Here I cannot take $\frac{9}{12}$ out of $\frac{8}{12}$, therefore. I borrow an Integer, *viz.* 12, and ſay, 9 out of 12, reſt 3. to which add $\frac{8}{12}$, reſt $\frac{11}{12}$, and carry 1 to 3 in 3 *l.* out of 11 *l.* reſt 8, ſo the *facit* is 8 $\frac{1}{12}$.

From 35 $\frac{3}{12}$
take 19 $\frac{7}{12}$
———
facit 15 $\frac{8}{12}$

from 42
take 16 $\frac{15}{24}$
———
facit 25 $\frac{9}{24}$

Subtraction of Decimals is the ſame as in whole Numbers, keeping the place of Units juſt under each other.

l.   *l.*   *s.*

From $\frac{2}{8}$,875   the $\frac{7}{8}$ is——17 : 6
Take $\frac{3}{4}$,75 $\frac{}{4}$ is——15 :

s. *d.*
Reſt ,125 or 2 : 6   reſt 2 : 6
Equal to the Decimal, 125

C H A P. XXI.

Multiplication of Fractions.

I. TO *Multiply proper Fractions*, Multiply the Numerators together for a New Numerator, and the Denominators multiply together for a Denominator.

Example. Multiply $\frac{7}{8}$ by $\frac{3}{4}$, *facit* $\frac{21}{32}$.

II. *If a mixt Number and a Fraction are to be multiplied together*, Reduce the mixt Number into an improper Fraction, and work as in the laſt.

Examp. Multiply 11 $\frac{2}{3}$ by $\frac{3}{4}$

$\frac{35}{3}$ by $\frac{3}{4}$, *facit* $\frac{105}{12}$.

l.   *l.*
Examp. Multiply 11 $\frac{2}{3}$ by 2 $\frac{3}{4}$

l. *s.*
$\frac{35}{12}$ by $\frac{11}{4}$, *fac.* $\frac{385}{12}$ or 32 : 1 :

III. *To multiply a mixt Number by an Integer*, Make the Integer an improper Fraction by placing [1] under it, and reduce your mixt Number into an improper Fraction, and work as in the *firſt Rule.*

Example. Multiply $7\frac{5}{8}$ by 4.

$\frac{61}{8}$ by $\frac{4}{1}$, *facit* $\frac{244}{8}$.

IV. *Multiplication of Decimals* is the ſame as in whole Numbers, ſaving as many Decimal Parts as are in the Multiplicand and Multiplier, ſo many muſt be cut off from the Product, which if it have not ſo many places, the defect muſt be ſupplied with Cyphers towards the Left-hand.

$$\begin{array}{lr}
\text{Multiply} & ,1005 \\
\text{by} & ,031 \\
\hline
 & 1005 \\
 & 3015 \\
\hline
\textit{facit} & ,0031155
\end{array}
\qquad\qquad
\begin{array}{rl}
11 & ,83 \\
2 & ,87 \\
\hline
 & 8281 \\
 & 9464 \\
 & 2366 \\
\hline
33 & ,9521
\end{array}$$

C H A P. XXII.

DIVISION of *FRACTIONS*

I. TO *Divide Single Fractions* : Reduce them to a Common Denominator, and Divide the New Numerator of the Dividend, by the New Numerator of the Diviſor.

Example. Divide $\frac{7}{8}$ by $\frac{3}{4}$,

 28 24

$24)\ 28$

facit $1\frac{4}{24}$

If

II. If it happens that the Fractions of the *Diviſor* be greater than the Fraction of the *Dividend*, after you have reduced them to a Common Denominator, the *facit* of ſuch Diviſion is a Fraction.

Example. Divide $\frac{3}{4}$ by $\frac{7}{8}$.

24 28 *facit* $\frac{24}{28}$.

III. *To Divide an Integer by a Fraction,* Multiply the Integer into the Denominator, and divide by the Numerator.

Example. Divide 8 by $\frac{5}{8}$.

5) 48

facit 9 $\frac{3}{5}$

IV. *To Divide a Fraction by an Integer,* The Numerator is Numerator, and the Integer multiplied by the Denominator is Denominator.

Example. Divide $\frac{3}{4}$ by 3, 4
3

12 *facit* $\frac{3}{12}$.

V. *To divide a mixt Number by an Integer.* Reduce the mixt Number into an improper Fraction, whoſe Denominator multiply by the Integer for your Diviſor.

Divide $3\frac{3}{8}$ by 2

$\frac{27}{8}$ by $\frac{2}{1}$ 16) 27

1 —— $\frac{11}{16}$ *facit* $1\frac{11}{16}$.

VI. *To Divide a mixt Number by a Fraction.* Reduce the mixt Number into an improper Fraction, and work as before.

Example. Divide $3\frac{3}{4}$ by $\frac{4}{7}$

$\frac{15}{4}$ by $\frac{4}{7}$

105 16) 105

9

facit $6\frac{9}{16}$.

VII. *To divide an Integer by a mixt Number.* Reduce the mixt Number and Integer into improper Fractions, and proceed as before.

Example. Divide 5 by $\frac{3}{5}$

$\frac{5}{1}$ by $\frac{18}{5}$

18) 25

7

facit $1\frac{7}{18}$

VIII. *To divide a mixt Number by a mixt Number,* Reduce them into improper Fractions, and divide as before.

Example. Divide $3\frac{3}{5}$ by $2\frac{3}{4}$

$\frac{18}{5}$ by $\frac{11}{4}$

55) 72

facit $1\frac{17}{55}$ 17

Diviſion of Decimals is the ſame as in whole Numbers, 'till the Work be done. And then uſe the Converſe of the Rule for *Multiplication*, viz ſo many *Decimals* as are in the *Dividend*, ſo many there muſt be in the *Diviſor* and *Quotient* : And if there be not ſo many, the *Quotient* muſt be ſupplied with Cyphers towards the left Hand.

Example. Divide 33,9521 by 2,87

2,87) 525

2382

facit 11,83 861

00

See the Converſe in Multiplication of Decimals.

CHAP. XXIII.

The Rule of Three in Fractions.

RULE: You muſt multiply your Second and Third Numbers together, and divide by your Firſt.

Obſerving the ſame Method as in whole Numbers, *viz.* That the Firſt and Third Numbers be of one Name or Denomination.

Examp. If $3\frac{2}{3}$ d. buy $\frac{2}{3}$ ℔. of *Tobacco*, What ſhall $95\frac{3}{4}$ l. buy?

$\frac{7}{2}$ of $\frac{1}{240}$ l. ℔. l.

$\frac{7}{480}$ — $\frac{2}{3}$ — $95\frac{3}{4}$

4

$\frac{383}{4}$ by $\frac{2}{3}$

$\frac{766}{12}$ *facit.*

Divide $\frac{766}{12}$ by $\frac{7}{480}$

```
             7      766
          ----     ----
            84     2880
                  2880
                 3360
                 --------
      84)        367680
  ------          316
facit 4377 ℔.     648
  of Tobacco      600
                 --------
                   12
```

C H A P. XXIV.

Menſuration of Plain Superficies.

The Menſuration of Plain Superficies (or Flat Meaſure*) ſuch as Board, Glaſs, Wainſcot, Painting, and the like.*

Note 1. THAT in *Superficial Meaſure*, 12 times 12 Inches, being 144 Inches, are the Number of Inches contained in a Square Foot of Superficial Meaſure.

2. That to ſquare any Number, is to multiply it in it ſelf, as if you would know how many ſquare Feet is contained in a Yard ſquare, multiply 3, the Feet in one Yard by 3, the Product is 9, and ſo many Feet make a Yard ſquare.

Example. How many ſquare Inches are there in a Yard ſquare?

1 Yard is 3 Feet.
12
36 Inches.
36
216
108
facit 1296 Inches.

General Rule is to multiply the Length by the breadth, the Product is the Content.

Examp. 1. A Board 12 Foot long, and 14 Inches broad, How many ſquare feet?

12
144
14
576
144 Inch.
144) 0016 Inch
facit 14 feet 576
00

12 foot.
$\frac{11}{6}$ 02
facit 14 ſquare feet.

But the beſt way is to take Aliquot Parts for the Inches, as you ſee wrought in the laſt Example. And this being the moſt practical and ready way, I ſhall purſue it in all the Variety of Superficial Menſuration that followeth.

Example 2. A piece of Wainſcot 24 Foot, 9 Inches long, and 11 Foot deep, how many ſquare Yards?

Feet Inch.
24—9
11 Mult.
9) 272—3
facit 30-0-8

Or thus,

yd fe. inc.
8—0—9 long.
3—2—0 deep.
24—2—3
1 $\frac{1}{3}$ —2—2—3
1 $\frac{1}{3}$ —2—2—2
facit 30—0—9

Here 24 Foot 9 Inches is multiplied by 11 Foot, the height which makes 272 Foot 3 Inches, that divided by 9, gives 30 Yards, 8 Inches, and $\frac{3}{4}$.

But the eaſieſt and beſt way is to bring the height and length into Yards, and then multiply them as you ſee in the *Example* following.

Example 3. A Painter hath done a Room 98 Foot about, and 11 $\frac{1}{2}$ Foot high, I demand the ſquare Yards therein?

yd. fe. inc.
32—2—0
3—2—6
98—0—0
1 $\frac{1}{3}$ —10—2—8
1 $\frac{1}{3}$ —10—2—8
6 $\frac{1}{2}$ —5—1—4
Facit 125—0—8

feet
3) 98
32—feet

yds. feet inch.
Anſ. 125 — —08

Example. A *Glaſier* hath done a Pane of Glaſs of 5 Foot, 73 high, and 2 Foot, 54 broad, at 6 *d.* the Foot ſquare.

Note, The *Glaſiers* Foot is divided into 10 parts, and every part into 10 parts more

5, 73
5, 54

2292
2865
1146

14, 5542 Foot.

Facit 14 $\frac{1}{2}$ or 14, 5542.

A General Rule to Meaſure Round or Square Pillars.

Multiply the length by the Circumference or *Round Pillars.*

And for *Square Pillars*, add the Four Sides or Breadth together, and multiply the Total by the Length.

Example 5. A Painter hath done a Pillar of 6 Foot 3 Inches Circumference, and 14 Foot 9 Inches long, I demand the Square Yards of Painting?

yrd. fo. inc.
4—2—9 length
2—0—3 circumf.

Inch. 9—2—6
36—3 $\frac{1}{2}$ 0—1—1 $\frac{9}{12}$

facit 10—1—0 $\frac{9}{12}$

Example 6. A Pillar 6 Yards 2 Foot 9 Inches long, and 2 Foot 1 Inch in breadth each ſide, how many ſquare Yards?

yrd. fo. inc.
6—2—5 length.
3—0—0 breadth.

yrd. fo. inc.
3—0—0 broad. *facit* 20—1—3

For *Regular Polygons*, add all the Sides together, and multiply the Total by the length.

For *Cones*, multiply half the length by the Circumference.

For *Pyramids*, add all the Breadths at the Baſe together, and multiply half the length by the Total.

For *Globes*, multiply the Area of the Circle by 4, it gives the Content.

CHAP. XXV.

Menſuration of Solids.

Solids, *ſuch as Stone, Timber, &c. are Meaſured by the* Cubick *or* Solid *Foot: Now a Cube is a Figure like a Dye of 6 equal ſides, and a* Cubick *Foot contains* 12 *Inches Square on every ſide.*

THE *Rule* is, Multiply the length by the breadth, and that Product multiply by the depth, which divide by 1728, the Cubick Inches in a Foot Solid.

Example.

A Piece of Timber 16 Foot long, 14 Inches broad, and 9 Inches deep, How many ſolid Feet doth it contain?

```
      12                    16
      12                    12
    ----                  ----
     144                   192
      12                    14
    ----                  ----
    1728                   168
                          192
                          ----
                          6828
                             9
                          ----
              1728)      24192 facit 14 foot
          ---------       6912
               14         ----
                           c00
```

Example.

A Stone 7 Foot 3 Inches long, 4 Foot 5 Inches broad, and 2 Foot 3 Inches deep, How many ſolid Feet ?

7—3 4—5 2—3
12 12 12

87 length 53 27
53 breadth

261
435

4611
27 deep

32277
9222

fac. 124497 Cubick Inches.

1728) 124497
3537
fact 72
ſolid feet 81

To find how many Inches in length make a Foot of Square-Timber, Multiply the Number of Inches ſquare in it ſelf for Diviſor, and make 1728, the Cubical Inch of a Foot, your Dividend.

Example.

A Piece of Timber 18 Inches ſquare, What length will it require to make a Foot Solid ?

18
18
———
144
18
——— ———
324) 1728
facit 5 Inc. 108

Example.

How many Inches in length will make a Foot at 12 Inches Square ?

12
12
———
144) 1728
——— 288
facit 12 In —
00

CHAP. XXVI.

Menſuration of Plank.

A TABLE, ſhewing how many Foot of Plank of all Natures make a Load or Tun of Timber.

50 Foot a Load. 40 Foot a Tun.

Inch	Foot.			
4 Plank	150	make a Load.	3	Which divided by, gives the quantity of Feet.
3	200		4	
2 ½	240		4⅘	
2	300		6	
1 ½	400		8	
1	600		12	
½	800		16	
4 Plank	120	make a Tun.	3	Which divided by, gives the quantity of Feet,
3	160		4	
2 ½	192		4⅘	
2	240		6	
1 ½	320		8	
1	480		12	
½	640		16	

Example.

In 7685 Foot of 4 Inch Plank, How many Load and Feet of Timber?

3) 35

15|0) 768|5

18|

11 $\frac{2}{3}$

Load Feet

51

facit 51 11 $\frac{2}{3}$

35 11 $\frac{2}{3}$ Feet

The Remainder 35, divided by 3, makes Feet 11 $\frac{2}{3}$

Example 2.

In 7685 Feet of 3 Inch Plank, How many Tun and Feet of Timber?

16|0) 768 5 Tun. Foot.

128 *facit* 48 — 01 $\frac{1}{4}$

48 4) 5

05

1 $\frac{1}{4}$

The Remainder of the Diviſion is divided by the third Column, as in the Example above, the 7685 Feet is divided by 160, the Number of Feet that make a Tun of 3 Inch Plank, and 5 remains, which divided by 4, the Figure even with it gives 1 Foot $\frac{1}{4}$, ſo the *Facit* is 48 Tun 1 $\frac{1}{4}$ Foot.

The END.

A
SHORT and EASY
METHOD;
After which
SHOP-KEEPERS
MAY
State, *Poſt*, and *Balance*
THEIR
BOOKS of ACCOMPTS.

By CHARLES SNELL, *Writing-Maſter*,
and Accomptant, *in* Foſter-Lane,
LONDON.

With whom Young GENTLEMEN
may Board.

A Short and Eaſy METHOD; *after which* SHOP-KEEPERS, *may* State, Poſt, *and* Balance *their* BOOKS *of* ACCOMPTS.

INSTRUCTIONS.

Queſt. WHAT is the firſt Thing I muſt do, who deſign to keep my Books of Accompts after this Method?

Anſw. You muſt make an Inventory; an Example of which is at the End of theſe *Inſtructions*.

Q. How muſt I poſt the firſt part of this Inventory?

A. You muſt poſt it on your Poſting-Book, *viz.*

Merchandize, to the *Debit* of that Accompt.

Caſh, to the *Debit* of your Caſh-Book.

George Mattock's Debt, to *Debit* of his Accompt.

Germain Bagin's Debt, to his *Debit* alſo.

And for the whole Sum (*viz*, 730 *l.*) you muſt give Counterpart in *Credit* of Stock.

Q. How muſt I poſt the other part of this Inventory?

A. To the *Credit* of *Tho. Roberts*, the Sum you owe him.

To the *Credit* of *John Field*, the Sum you owe him.

And for the whole Sum (*viz.* 110 *l.*) you muſt *debit* Stock. See the ſeveral Accompts, *Fol.* 1. 2.

Q. I ſee by the 1ſt Page of the Day-Book, that it contains Entries of Goods ſold to ſundry Perſons: How muſt theſe be poſted?

A. To *debit* of *Rich. Hunt*, what ſold him.

To *debit* of *Antho. Coccart*, the like.

To *debit* of *J. Graves* and Company, the like.

To *debit* of *Rich. Hunt*, the like. See their Accompts, *Fol.* 3.

And Counterpart muſt be given for the whole Sum of this Page (*viz.* 16 *l.* 10 : 10 *d.*) on *Credit* of Merchandize in the ſaid Poſting-Book. See Account of Merchandize, *Fol.* 1.

And the like muſt be done for the Pages 2, 3, 4, 5 and 6 of the ſaid Day-Book.

Note, That the Ready Money taken for Goods ſold, is poſted each Month to the *debit* of your Caſh-Book. See the Caſh-Book

Q. How muſt I enter the Moneys I receive (of Debtors on my Ledger?)

A. On the *debit* ſide of your Caſh-Book: See that Book.

Q. How muſt I poſt thoſe Sums received, into my Poſting Book?

A. To the *Credits* of the Perſons, of whom received. See the Accompts of

Richard Hunt, —— Fol. 3.
Anthony Cocoart, —— Fol. 3.
John Graves, and Company —————— Fol. 3.
Tho. Woodman, —— Fol. 3.
Henry Taft, ———— Fol. 4.

Q. How muſt I poſt (into my Poſting-Book) the Total Receipts of the Month of *Auguſt* (*viz.* 57 *l.* 3 *s.* 10 *d.*?

A. You muſt poſt that Total, to the *debit* of your Caſh, in your Poſting-Book, writing,

To Sundries. Received per *Caſh-Book.* See the Accompt of Caſh, in the Poſting Book. *Fol.* 1.

Do the like for *September* and *October*'s Receipts.

Q. How muſt I enter the Moneys I pay to thoſe I owe to, and who have Credit in my Poſting-Book?

A On the *Credit-ſide* of your Caſh-Book. See the Caſh-Book.

Q. How muſt I poſt thoſe Sums paid?

A. To the *Debits* of the Perſons to whom paid. See the Accompts of *Thomas Roberts*, Fol. 2. and *John Field*, Fol. 2 in your Poſting-Book.

Q. How muſt I poſt (into my Poſting-Book) the Total Payments of the Month of *Auguſt*, (*viz.* 30 *l*)?

A. You muſt poſt it to the *Credit* of your Caſh, in your Poſting-Book, writing,

By Sundries, paid per *Caſh-Book.* See the Account of Caſh in your Poſting-Book, *Fol.* 1.

Q. I underſtand by theſe *Directions*, how to *State*, and *Poſt* my Books, How muſt I proceed in *Balancing* my Poſting-Book?

A Value your Merchandize remaining unſold, and Enter the Sum of their Value on *Credit* of the Account of Merchandize, in your Poſting-Book. See the Account of Merchandize. *Fol.* 1.

And give Counterpart in *debit* of the Accompt of Balance in the ſaid Poſting-Book. See the *Debit* of Balance, *Fol.* 4.

Which done, ſubtract the *debit* ſide of ſaid Account of Merchandize from its *Credit*, and place the Remainder (*viz.* 97 *l.* 10 *s.*) on the *debit* ſide of it. See the Accompt, *Fol.* 1.

And give Counterpart on *Credit* of *Profit* and *Loſ* in the ſaid Poſting-Book. See Account of *Profit* an *Loſs*, *Fol.* 4.

Then add up Debtor and Creditor of the Accoun of *Caſh* in ſaid Poſting Book, and ſubtract th *Credit* from the *Debit*, and place the *Caſh* remainin (*viz.* 297 *l.* 07 *s.* 01 *d.*) on *Credit* of ſaid Accomp of *Caſh*. See the Accompt, *Fol.* 1. and give Counterpart in *Debit* of the Accompt of Balance. Se ſaid Accompt of *Balance*, *Fol.* 4.

Q. How muſt I do with the Accompt of *Expences*?

A. Write on its *Credit-ſide* (the 32 *l.*) By *Profit* an *Loſs*, and give Counterpart in *Debits* of the Accompt of *Profit* and *Loſs*. See both the Accompts *Fol.* 2 4.

Q. How muſt I do with the Accompt of *Georg* *Mattock*, who I find (by his Accompt) owes m 10 *l.*

A. You muſt write on *Credit* of his Accompt. By Balance, now owing to me 10 *l.*

And give Counterpart on *Debit* of *Balance*. Se both the Accompts, *Fol.* 2. 4.

Do in the ſame manner by the Accompts o

Germain Bagin, —— Fol.
Richard Hunt, —— Fol.
John Graves and Company. —— —— —— Fol.
and *Thomas Woodman*. — Fol.

See their particular Accompts in your Poſting Book.

Q. How muſt I do with the Accompt of *Thoma* *Roberts*, to whom I find I owe 20 *l.*?

A. You muſt write on the *Debit* of his Accomp To Balance, now due to him 20 *l.*

And give Counterpart on *Credit* of *Balance.* See both the Accompts. *Fol.* 2. 4.

Do the like with the Accompt of *John Field.* See his Accompt, *Fol.* 2.

Q. How muſt I do to Balance; or Cloſe, the Accompts of *Stock*, and *Profit* and *Loſs*?

A. Subtract the *Debit* of Profit and Loſs from its *Credit*, and ſet the Remainder (*viz.* 65 *l.* 10 *s.* being your clear Gains during the Time of this Trade) on the *Debit* of *Profit* and *Loſs*. See the Accompt, *Fol.* 4.

And give Counterpart in *Credit* of Stock. See Accompt of *Stock*, *Fol.* 1.

Q. How muſt I do to Balance the Accompt of *Stock*?

A. Subtract its *Debit* from its *Credit*, and ſet the Remainder (*viz. l.* 685 : 10 *s.* being your preſent *Net-Stock*) on the *Debit* of *Stock*. See the Accompt, *Fol.* 1.

And give Counterpart in *Credit* of Balance. See Accompt of *Balance*, *Fol.* 4.

This done, your Poſting-Book is Balanced, and the Accompt of *Balance* (if you have proceeded right) will be equal on both Sides.

The

The INVENTORY.

London, Auguſt 1, 1718.

I Have in *Merchandize* of ſundry Sorts, to the Value of		*l.* 520 : 00 : 0
In Caſh, or Ready Money ——		*l.* 180 : 00 : 0
Owing to me, by		
Richard Mattock ————		*l.* 20 : 00 :
Germain Bagin ————		*l.* 10 : 00 : 0
		l. 730 : 00 : 0
Owing by me, to		
Thomas Roberts ..	*l.* 60 : 00 : 00	
John Field ——	*l.* 50 : 00 : 00	
		l. 110 : 00 : 0
My Net-Stock ..		*l.* 620 : 00 : 0

A BOOK

A
BOOK
OF
RECEIPTS and PAYMENTS,

Otherwiſe called

CASH-BOOK.

1.

Receipts - - - Debtor.

				l.	*s.*	*d.*
		Auguſt, 1718				
	1	To Stock, by Inventory ——	1	180	-	--
	8	*Richard Hunt*, of him —— ——	3	4	—	--
	12	*Anthony Coccart*, ditto —— ——	3	3	16	06
	16	*John Graves* and Comp. ditto--	3	1	01	06
	20	*Thomas Woodman*, ditto ——	3	4	13	--
	30	*Henry Taft* ——ditto—— ——	4	0	15	---
pt.	31	Merchandize ſince 1ſt *Auguſt*—	—	42	17	10
		l. 57 : 03 : 10 Received.	—	237	03	10
		September, 1718.				
		Laſt Balance.	—	237	03	10
	11	*Richard Hunt*, of him —— ——	3	8	15	11
	—	*Anthony Coccart*, ditto ——	3	3	—	---
	15	*George Mattock*, ditto ——	2	10	---	---
	20	*German Bagin*, ditto —— ——	2	5	---	—
	24	*Henry Taft* —— —— ——	4	2	06	—
	30	*John Graves* and Comp. ditto—	3	2	---	03
pt.	—	Merchandize ſince 1ſt *Sept.*——	—	38	6	06
		l. 69 : 18 : 08 Received	—	277	02	06

Pay

	I. Payments - - - Creditor.		*l.*	*s.*	*d.*
	August, 1718.				
23	By *Tho. Roberts*, to him	2	20	---	---
31	*John Field* - - - ditto	2	10	---	---
	Paid this Month		30	---	---
	Resting *per* Balance		207	03	10
			237	03	10
	September, 1718.				
22	*John Field* - - to him	2	5	-	---
28	*Thomas Roberts*, ditto	2	10	---	---
	Paid this Month		15	---	---
	Resting *per* Balance		262	02	06
			277	02	06

		2. Receipts -- Debtor.		*l.*	*s.*	*d.*
		October, 1718.				
		Laſt Balance	...	262	02	06
	11	To *Anthony Coccart*, of him	3	2	...	...
	20	*John Bird* —— ditto	4	2	18	...
	31	*John Graves* and Comp. ditto	3	5	15	3
pt.	—	Merchandize ſince 1ſt *Octob.*	...	86	11	04
			...	—	...	...
		l. 97 : 04 : 07 Received.	...	359	07	01
		November, 1718.				
		Laſt Balance	...	297	07	01

	2. Payments - - - Creditor.		*l.*	*s.*	*d.*
	October, 1718.				
24	By *Tho. Roberts*, to him	2	10	---	---
28	*John Field* - - - ditto	2	20	---	---
31	Expences, *&c.* ſince 1 *Auguſt*	2	32	---	---
	Paid this Month	---	62	---	---
	Reſting *per* Balance	---	297	07	01
		---	359	07	01
	November, 1718.				

A
DAY--BOOK,
Otherwiſe called
JOURNAL.

		l.	s.	d.
	Day-Book 1.			
	Accompts Debtor to Merchandize Sold.			
	Aug. 1. 1718.			
3.	*Richard Hunt.*			
	39 ½ Ells Linen, at —— *s.* 3 : 2	6	05	01
	ditto			
3.	*Anthony Coccart.*			
	58 ½ Ells Linen, at —— *s.* 2 : 4	6	16	06
	ditto 5.			
3.	*John Graves*, and Comp.			
	3 doz. Sciſſors, at 4. 0. *l.* 0 : 12 : -			
	3 doz ditto — 3. 9. *l.* 0 : 11 : 3			
	6doz.round-points 3. 9. *l.* 1 : 02 : 6			
	6 doz. middling - 2. 8. *l.* 0 : 16 : -			
		3	01	09
	ditto 10			
3	*Richard Hunt,*			
	3 Maſſes of Pearl, at — *l.* 0 : 2 : 6	0	07	06
1.	Merchandize ſold —	16	10	10

Day-Book 2.

		l.	s.	d.
	Accompts Debtor to Merchandize.			
	Sold.			
	——— *Auguſt* 17 1718. ———			
3.	*Thomas Woodman,*			
	22 doz. Sciſſors—4. 3 *l.* 4 : 13 : 6			
	6 doz middling 4. 3. *l.* 1 : 05 : 6			
	9 doz. ditt — 2. 8. *l* 1 : 04 : 0			
	12 doz. ſmall — 2. 6. *l.* 1 : 10 : -			
		8	13	..
	——— ditto 20. ———			
3.	*Anthony Coccart,*			
	1 Looking-glaſs ——— *l.* 0 : 08 : 6			
	1 ditto middling——— *l.* 0 : 09 : 6			
	3 Tortoiſe-ſhell Combs *l.* 0 : 06 : 0			
		1	04	..
	——— ditto 23. ———			
4.	*Henry Taft,*			
	1 doz. Sciſſ. with Caſes *l.* 0 : 09 : 6			
	1 doz. without Caſes - *l.* 0 : 05 : 6			
		0	15	..
1.	Merchandize ſold——	10	12	..

Day-

	Day Book 3.	l.	s.	d.
	Accompts Debtor to Merchandize			
	Sold			
	Aug. 27. 1718.			
3.	*Richard Hunt,*			
	3 pair Sciſ. half barb —*l.* 0 : 06 : .			
	1 doz. ditto, ſmall ſett. *l.* 0 : 05 : .			
	2 Knives at 20 *d.*— *l.* 0 : 03 : 4			
	1 doz Comb-bruſhes— *l.* 0 : 03 : .			
	6 Pen-knives, at 8 *d.*— *l.* 0 : 04 : .			
	12 doz Claſp knives— *l.* 1 : 17 : .			
	24 doz. Kniv. horn Han. *l.* 3 : — : .			
		5	18	4
	ditt. 31.			
1.	Receipts in ready Money for Goods ſince the 1ſt of *Auguſt*	42	17	10
	September 3. 1718.			
4	*Henry Taft,*			
	A parcel of Sciſſors, at - -	0	12	—
1.	Merchandize ſold	49	08	2

Day-Book 4.

		l.	s.	d.
	Accompts Debtor to Merchandize.			
	Sold.			
	September 6. 1718.			
3.	*Richard Hunt*,			
	2 Maſſes Pearl, at ——— *s.* 2 : 6	0	05	..
	ditto 11.			
3	*Richard Hunt*,			
	13 Ells Cloth, at ——— *s.* 2 : 6	1	12	06
	ditto 15.			
3.	*Anthony Coccart*,			
	4 Maſſes Pearl, — 2. 6. *l* 0 : 10 : -			
	1 ½ doz. Pendants 4 0. *l* : 06 : -			
		0	16	..
	ditto 16.			
4.	*Henry Taft*,			
	12 doz. Horn-trumpets 2. *l.* 1 : 04 : -			
	2 doz Comb-bruſhes 3. *l.* 0 : 06 : -			
	2 doz. ditto ——— 2. *l.* 0 : 04 : -			
		1	14	..
1.	Merchandize ſold —	4	07	06

	Day-Book 5.	*l.*	.	*d.*
	Accompts Debtor to Merchandize.			
	Sold.			
	—— *September* 30, 1718.——			
4.	*John Bird,*			
	3 Maſſ. Ven. Pearl, at *l.* 1 : 00 : -			
	2 doz. Sciſſors, at —*l.* 0 : 09 : -			
	3 doz. fine Combs, at *l.* 1 : 9 : -			
		2	18	—
	——ditto.——			
3.	*John Graves* and Comp.			
	1 piec. white Gauze qt 24 Ells.			
	1 piece -- ditto —— 22			
	1 piece -- ditto —— 20			
	1 piece -- ditto —— 18			
	1 piece yellow, ditto - 20			
	1 piece black, ditto — 19			
	Ells --- 123 at 21 *d* ---	0	15	03
—	Merchandize ſold——	13	13	03

	Day-Book 6.	l.	s.	d.
	Accompts Debtor to Merchandize.			
	Sold.			
	——*September* 30, 1718.——			
1.	Receipts in ready Money for Goods ſince the 1ſt of *September* ——	38	16	06
	—— *October* 2, 1718.——			
3.	*Thomas Woodman*,			
	1 doz Sciſ. Caſes, at - - *l.* 0 : 12 : -			
	4 Maſs Pearl, at 2 *s.* 0 *d.* *l.* 0 : 08 : -			
	29 Maſs, ditto, at 2 *s.* 8 *d.* *l.* 3 : 17 : 4	4	17	04
	——ditto 29.——			
3	*Thomas Woodman*,			
	2 piec. Tabby, qt, 61 Ells —— 8 *s.* 6 *d.* } *l.* 25 : 18 : 6			
	1 piec. ditto, qt. 28 Ells, —— 8 *s.* 6 *d.* } *l.* 11 : 18 : -	37	16	06
	——ditto 31.——			
2	Receipts in ready Money for Goods, ſince the 1ſt of *October* —— ——	86	11	04
	Merchandize ſold ——	168	01	08
1				

A POST.

A
POSTING-BOOK,
Otherwiſe called
LEDGER.

ALPHABET.

B.
Bazin, Germain —— 2
Bird, John —— 4
Balance —— 4

C.
Coccart, Anthony — 3
Caſh —— 1.

E.
Expenc. and Abatem. 2.

F.
Field, John —— 2.

G.
Graves, John & Com. 3.

H.
Hunt, Richard —— 3.

M.
Merchandize —— 1.
Mattock, George —— 2.

P.
Profit and Loſs —— 4.

R.
Receip. and Paym. Caſh 1.
Roberts, Thomas —— 2.

S.
Stock —— 1.

T.
Taft, Henry —— 4.

W.
Woodman, Thomas —— 3.

		Poſting-Book 1.		*l.*	*s.*	*d.*
1718		Stock - - - Debtor.				
Aug.	1	To Sundry to whom I owe ---	---	110	---	---
Oct.	31	To Balance N. Stock	4	685	10	--
			---	795	10	---
1718		Merchandize, Debtor.				
Aug.	1	To Stock, *per* Inventory ——	1	520	---	---
Oct.	31	To P. and L. carried thither---	4	97	10	---
			—	617	10	---
1718		Receipts, or *Caſh*-Debtor.				
Aug.	1	To Stock, Money *per* Inven. -	1	180	---	---
	31	To Sund. *per* Book, page 1 ——	---	57	03	10
Sept.	30	To Sundries —— 1 ——	---	69	18	08
Oct.	31	To Sundries —— 2 ——	---	97	04	07
			---	404	07	01

Poſting

Poſting Book 1.

				l.	*s.*	*d.*
1718		Stock --- Creditor.				
Aug.	1	By Sundr *per* Inventory ——		730	--	—
&	31	By Pro. & Loſs, gain'd in 3 Mo.	4	65	10	—
				795	10	—
1718		Merchandize, Creditor.				
Aug.	10	By Sund. ſold, Day Book 1 ——		16	10	10
	23	By Sundries — page — 2 ——		10	2	--
Sept.	3	By Sundries —— —— 3 ——		49	8	02
	16	By Sundries —— —— 4 ——		4	07	06
	16	By Sundries —— —— 5 ——		13	13	03
Oct.	31	By Sundries —— —— 6 ——		168	[illegible]	03
				262	13	05
	--	**By Bal. value of Remains** ——	4	354	16	07
				6 7		--
1718		Payments, or *Caſh*-Creditor.				
Aug.	31	By Sundries *per* Book — 1 ——		30	--	—
Sept.	30	By Sund. — page —— 1 ——		15	--	—
Oct.	31	By Sund. — page —— 2 ——		62	--	--
				107	--	—
		By Balance, reſts in *Caſh* ——	4	297	07	01
				[illegible]	07	1

		Poſting-Book 2.		*l.*	*s.*	*d.*
1718		Expences, *&c.* Debtor.				
Oct.	31	To Paym. hereon ſince 1 *Aug*	1	32	--	—
1718		*George Mattock*, Debtor.				
Aug.	1	To Stock, now owing me——	1	20	--	—
1718		*Germain Bazin*, Debtor.				
Aug.	1	To Stock, now due to me——	1	10	--	—
1718		*Thomas Roberts*, Debtor.				
Aug.	23	To Payment, to him ———	1	20	--	—
Sept.	28	To ditto —— —— —— ——	1	10	--	—
Oct.	24	To ditto —————————	1	10	--	—
				40	--	—
		To Bal. now due to him--	4	20	--	—
				60	--	—
1718		*John Field*, Debtor.				
Aug.	31	To Payment, to him ———	1	10	--	—
Sep.	22	To ditto—————	1	5	--	—
Oct.	28	To ditto —— ————	1	20	--	—
				35	--	—
	31	To Bal, now owing him--	4	15	--	—
				50	--	—

Poſting-

Poſting-Book 2.

				l.	s.	d.
1718		Expences, *&c.* Creditor.				
Oct.	31	By *P.* and *L* carried there ——	4	32	--	—
1718		*Georg Mattock,* Creditor.				
Sept.	15	By Receipt, of him ——	1	10	--	—
Oct.	31	By Bal. now owing me ——	4	10	--	—
			--	—	--	—
			--	20	—	—
1718		*Germain Bazin,* Creditor.				
Sept.	20	By Receipt, of him ——	1	5	—	—
Oct.	31	By Bal. now owing me ——	4	5	—	—
			--	—	—	—
			--	10	—	—
1718		*Thomas Roberts,* Creditor.				
Aug.	1	By Stock, now owing him ——	1	60	—	—
1718		*John Field,* - - Creditor.				
Aug.	1	By Stock, now due to him ——	1	50	—	—

Poſting-Book 3.

				l.	s.	d.
1718		*Richard Hant*, Debtor.				
Aug.	1	To Merchand. ſold him —	1	6	5	01
	10	To ditto —	1	0	07	06
	17	To ditto, a Parcel —	1	5	8	04
Sept.	6	To ditto, 2 Maſs. Pearl —	1	0	05	--
	11	To ditto 14 Elis Clo. at 2 *s.* 6 *d.*	1	1	12	06
			—	14	08	05
1718		*Anthony Coccart*, Debtor.				
Aug.	1	To Merch. ſold him —	1	6	16	06
	20	To ditto, a Parcel —	1	1	04	--
Sept.	15	To ditto, a Parcel —	1	0	16	--
			—	8	16	06
1718		*John Graves* and Comp Debtor.				
Aug.	5	To Merch. a Parcel —	1	3	01	09
Sept.	30	To ditto, a Parcel —	1	10	15	03
			—	13	17	--
1718		*Thomas Woodman*, Debtor.				
Aug.	17	To Merch. a Parcel —	1	8	13	--
Oct.	2	To ditto, a Parcel —	1	4	17	04
	29	To ditto, a Parcel —	1	37	16	06
			—	51	06	10

Poſting-Book 3.

				l.	*s.*	*d.*
1718		*Richard Hunt*, Creditor.				
Aug.	8	By Receipt, of him	1	4	---	---
Sept.	11	By ditto	1	8	15	11
			---	12	15	11
Octob	31	By Bal. now owing me	4	1	12	06
			---	14	08	05
1718		*Anthony Coccart*, Creditor.				
Aug.	12	By Receipt, of him	1	3	16	06
Sept.	11	By ditto	1	3	---	---
Octob	11	By ditto	1	2	---	---
			---	8	16	06
1718		*John Graves*, & Cp. Creditor.				
Aug.	16	By Receipt, of them	1	1	01	06
Sept.	30	By ditto	1	2	---	03
Octob	31	By ditto	1	5	15	03
			---	8	17	---
		By Bal. now owing me	4	5	---	---
			---	13	17	---
1718		*Thomas Woodman*, Creditor.				
Aug	30	By Receipt, of him	1	4	13	---
Octob	31	By Balance, now owing me	4	46	13	10
			---	51	06	10

Poſting-Book 4.

				l.	s.	d.
1718		*Henry Taſt*, Debtor.				
Aug.	23	To Merch. a Parcel	1	0	15	--
Sept.	3	To ditto, a parcel	1	0	12	--
	16	To ditto, a parcel	1	1	14	--
			---	3	01	--
1718		*John Bird.* - - Debtor.				
Sept.	30	To Merch. a parcel	1	2	18	--
1718		Profit and Loſs - - Debtor.				
Octob.	31	To Expences,*&c.* brought here	2	32	--	--
	—	To Stock, gain'd ſince 1ſt *Aug.*	1	65	10	
			---	97	10	--
1718		Balance - - - - Debtor.				
Octob	31	To Merch. now remaining	1	354	16	07
	—	To Receipts, or *Caſh* reſting	1	297	07	01
	---	To *Geor. Mattock*, now owing	2	10	--	--
	---	To *Germain Bazin*, ditto	2	5	--	--
	---	To *Rich. Hunt*, ditto	3	1	12	06
	---	To *John Graves* and Com. ditto	3	5	--	--
	--	To *Tho. Woodman*, ditto	3	46	13	10
			---	720	10	--

Poſting·

Poſting Book 4.

				l.	s.	d.
1718		*Henry Taft*, Creditor.				
Aug.	30	By Receipt of him ———	1	0	15	---
Sept.	24	By ditto in full ———	1	2	06	---
			—	3	01	---
1718		*John Bird* - - - Creditor.				
Oct.	20	By Receipt in full ———	1	2	18	---
1718		Profit and Loſs - - Creditor				
Oct.	31	By Merch. to cloſe that Accou.	1	97	10	---
1718		Balance - - - Creditor.				
Oct.	31	By *Tho. Roberts*, I owe him ——	2	20	---	---
	—	By *John Field* - - - ditto ———	2	15	---	---
			—	35	---	---
	—	By Stock, for its Neat ———	1	685	10	---
			—	720	6	---

INSTRUCTIONS.

Queſt. HAving taught me how to *State*, *Poſt* and *Balance* my Books; What Method muſt I uſe at the *going out* of theſe Books *into* others?

Anſw. From the *Balance* of theſe Books, (See Poſting-Book, *Fol.* 4.) you muſt draw out another *Inventory*, as follows:

The INVENTORY.

London, *October* 31, 1718.

I Have in *Merchandize* of ſundry Sorts, to the Value of	*l.* 354 : 16 : 07
In *Caſh*, or *Ready-Money*	*l.* 297 : 07 : 01

Owing to me, by

George Mattock	*l.* 10 : 00 : 00
Germain Bazin	*l.* 5 : 00 : 00
Richard Hunt	*l.* 1 : 12 : 06
John Graves and Comp.	*l.* 5 : 00 : 00
Thomas Woodman	*l.* 46 : 13 : 10
	l. 720 : 10 : 0

Owing by me, to

Thomas Roberts	*l.* 20 : 00 : 00	
John Field	*l.* 15 : 00 : 00	
		l. 35 : 00 : 00

My Net Stock — *l.* 685 : 10 : 00

And Poſt it into your *New Poſting-Book*, as by the *Directions* given for the Poſting your other *Inventory*.

Q. In the *Caſh-Book* on *Debtor ſide*, (for Inſtance, in the Month of *Auguſt*) are Figures juſt before the *Money-Lines*, as 1 before 180 *l.* and 3 before 4 *l.* &c. I deſire to know what thoſe Figures ſhew?

A. The Figure 1 (before 180 *l* in the firſt Line) ſhews the *Folio* of the *Poſting-Book*, on which the Accompt of *Stock* ſtands.

The Figure 3 following *Richard Hunt* in the next Line, ſhews the *Folio* of the *Poſting Book* whereon the Accompt of *Richard Hunt* ſtands.

The like is to be underſtood of the Figure 3 following *Anthony Coccart*: The 3 following *John Graves* and Company. The 3 following *Thomas Woodman*: And the 4 following *Henry Taft*, on *Debtor-ſide* of ſaid *Caſh-Book* for the Month of *Auguſt*, and of thoſe on *Debtor-ſide*, of the ſaid Book for the Months of *September* and *October*.

Q. What do the Figures (on the *Creditor ſide* of ſaid *Caſh-Book*) which come juſt before the *Money-lines* ſhew? For Inſtance, in the Month of *Auguſt* on *Creditor-ſide*, the Figure 2 following *Thomas Roberts*, juſt before the 20 *l.* and the 2 following *John Field*, juſt before the 10 *l.*

A. The Figure 2 following *Thomas Roberts*, ſhews that *his* Accompt ſtands in *Poſting-Book*, Folio 2. And the 2 following *John Field*, ſhews, that *his* Accompt ſtands alſo in ſaid Book, Fol. 2.

The like is to be underſtood of the Figures 2. 2. on *Creditor-ſide* of the *Caſh Book* for *September*.

And of the Figures 2. 2. 2 on *Creditor-ſide* of the *Caſh-Book* for *October*.

Q. What does the Sum *l.* 57 : 03 : 10, at the *Foot* of the *Debtor ſide* of the *Caſh-Book* for the Month of *Auguſt*, ſhew?

A. It ſhews the *Total Sum received* during the Month of *Auguſt*, and is produced by ſubtracting the 180 *l.* in the firſt Line, from the *l.* 237 : 03 : 10 on the *Debtor* of that Accompt.

The like is to be underſtood of the *l.* 69 : 18 : 0 at the *Foot* of *September*, and of the *l.* 97 : 04 : 0 at the *Foot* of *October*.

And as thoſe *Sums* ſhew the *Total Receipt* during each *Month*, ſo the *Sum* 30 *l.* on *Credit-ſide* of the *Caſh-Book* for *Auguſt*, the *Sum* 15 *l.* for *September*, and the *Sum* 62 *l.* for *October*, ſhew the *Total Payment* during each of thoſe *Months*.

Q. How is the *Balance* (or *Reſt* of Money) in *Caſh*, found?

A. You muſt ſubtract the 30 *l.* (on *Credit* of *Auguſt's Caſh-Book*) from the *l.* 237 : 03 : 10 on the *Debit-ſide*, and the Remainder being *l.* 207 : 03 : 1 is the *Balance* or *Reſt* of Money, in *Caſh*, which *placed* under the 30 *l.* *paid*, and *added* to it, makes a juſt *Balance* with the *Debtor-ſide*. See the *Caſh-Book* for the Month of *Auguſt*.

You are to do in the like manner to find the *Balances*, or *Reſts* of *Caſh* for the Months of *September* and *October*. See the *Caſh-Book* for both thoſe Months.

Q. What does the Figure 3 againſt *Richard Hunt* (in the *Day-Book*) and the 3 againſt *Anthony Coccart*, and the other Figures in the *Margin* of the *Day-Book*, ſhew?

A. They ſhew the *Folio's* (of the *Poſting-Book*,) whereon the Accompts of *Richard Hunt*, *Anthony Coccart*, and the other Accompts ſtand.

And alſo ſhew that thoſe *Perſons* or *Accompts* are *Debtors*; as the Figure 1 under the *ſmall Line* in the *Margin*, and at the *Foot* of each Page of the *Day-Book*, juſt againſt the Words *Merchandize ſold*, ſhews that the Accompt of *Merchandize* ſtands in *Poſting-Book*, on *Fol.* 1. and is *Creditor*.

Q. What do the Figures (in the *Poſting-Book*) coming juſt before the *Money Lines* on *Debtors-ſide* ſhew?

A. As the *Words* in each Line on *Debtor-ſide* of ſaid *Poſting-Book* immediately following the Word *To*, ſhew what *Accompts* or *Perſons* are to be *Credited*, or *Counterparted*, ſo thoſe *Figures* ſhew on what *Folio's* in the *Poſting-Book* thoſe *Accompts*, or *Perſons* are to be found.

Q. What do the Figures coming juſt before the *Money Lines* on *Creditor-ſide* of the *Poſting-Book* ſhew?

A. As the *Words* in each Line on *Creditors-ſide* of ſaid *Poſting-Book*, immediately following the Word *By*, ſhew what *Accompts*, or *Perſons* are to be *Debited* or *Counterparted*; ſo thoſe *Figures* ſhew on what *Folio's* in the *Poſting-Book* thoſe *Accompts* or *Perſons* are to be found.

Q. How muſt I Enter the *Goods* that I *Buy*?

A. You muſt Enter them in a *Bought-Book*, as for Inſtance.

Merchandize Debtor to Perſons.
Bought,
Of (ſuppoſe) *John Thompſon*, *viz.*

46 Ells Linen, at 3 *s.* *per* Ell ———	*l.* 6 : 18 : 00
52 Ells, ditto, at 4 *s.* *per* Ell ———	*l.* 10 : 08 : 00
——— ———	*l.* 17 : 06 : 00

This Article (and others of a like Nature) muſt be poſted into your *Poſting-Book*, to the *Credit* of the Accompt of the Perſon of whom Bought. Here *John Thompſon*, and the *Total of each Page* of your *Bought-Book*, muſt be poſted in ſaid *Poſting-Book* to the *Debit* of Accompt of *Merchandize*.

Q. I have been told, that a good Method of *Book-Keeping* will ſhew to the Owner of the Books, or others concerned, theſe following *neceſſary* (and many other) Particulars, *viz.*

Concerning Merchandize.

N°. 1. What *Goods* (during the whole, or an Time of the Accompt) have been *Bought*, brough into Charge, when, of whom, and at what Prices.

2. What *Goods* (as above) have been *ſold*, iſſue out of the Charge, when, to whom, and at wha Prices.

3. The whole Quantity *Bought*, and *Sold*, and th *Profit*, or *Loſs*, ariſing on thoſe ſo diſpoſed of.

Concerning Caſh *or* Money.

4. What Sums of *Money* have been *Received* (a above) when, of Whom, and on whoſe Accompt alſo whether in part or in full.

5. What Sums of *Money* have been *Paid* (as above when, to whom, and on whoſe Accompt. Alſ whether in part or in full.

6. What Sum Total has been *Received*, and *Pai* (during the whole, or during any Time as above and conſequently the *Sum Reſting* in *Caſh*.

Concerning Perſons *with whom I deal.*

7. For what Sums *they ſtand indebted*, from wha Dates, and for what.

8. For what Sums *I ſtand indebted* to them, from what Dates, and for what.

9. Whether any *Ballance*, or *Remainder*, be du *from them* to me, or *from me* to them, and what Sum

Concerning my Expences.

10. What *Expence* I have been at (during th Time of the Accompt, or any part of it) and ſuc *Expence* conſider'd and allow'd, then what *Neat Gai* or *Loſs* has attended.

Concerning my Stock.

11. What *Stock* I *began* with, and what my *preſent Stock* is, and what Particulars compos'd each.

Now I deſire you to ſhew me how this Method will anſwer all theſe Particulars?

A. Concerning Merchandize, Your *Bought-Book,* will ſhew you the particular Demands of *Numb.* 1.

And your *Day-Book,* thoſe in *Numb.* 2.

The *Debtor ſide* of Accompt of *Merchandize* in your *Poſting-Book,* will ſhew the whole Quantity *bought,* and its *Creditor-ſide,* the whole Quantity *ſold,* and the ſame Accompt ſhews you alſo the *Profit* or *Loſs* ariſing on thoſe you have diſpoſed of: (See the Accompt of *Merchandize* in *Poſting-Book,* Fol. 1.) Thus the Demands in *Numb.* 3. are ſhewn.

Concerning Caſh, or *Money,* The *Debtor-ſide* of your *Caſh Book,* anſwers the Demands in *Numb.* 4. and the *Creditor-ſide* of ſaid Book ſhews the Demands in *Numb.* 5. and conſequently thoſe in *Numb.* 6. by comparing the *Debtor* and *Creditor-ſides.*

The *Creditor-ſide* alſo of the ſaid Book ſhews the *Balance* (or *Reſt* that ſhould be found) in *Caſh.*

Concerning Perſons with whom you deal. The *Debtor-ſides* of their Accompts ſhew the Demands of *Numb.* 7. and the *Creditor-ſides* thoſe of *Numb.* 8.

And conſequently their Accompts compared in *Debtor* and *Creditor,* ſhew the Demands of *Numb.* 9.

Concerning your Expences. The Accompt of *Expences* in your *Poſting-Book* ſhews the Expence, as in *Numb.* 10. and the Accompt of *Profit* and *Loſs,* will ſhew the *Neat-Gain* or *Loſs.*

Concerning your Stock. The Accompt of *Stock* in your *Poſting-Book* ſhews *that* you *began* with, and the Accompt of *Balance* ſhews you your *preſent Stock,* and of what Particulars it conſiſts, and anſwers the Demands in *Numb.* 11.

FINIS.

ADVERTISEMENT.

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